

Tables

Further abbreviations used in the tables

A	anion
α	degree of dissociation
b.c.	body centred
b.pt., b.p.	boiling point at 1 atm. pressure
C.No.	co-ordination number
c.p.	close packed
dec.	decomposes, decomposition
def.	deformed, deformation
disprop.	disproportionation
diss.	dissociated, dissociation
dist.	distorted
f.c.	face centered
$\Delta H_{\max(\min)}$	maximum (or minimum) integral heat of formation in a binary system
hetp.	heteropolar
homop.	homopolar
<i>italics</i>	estimated values
K	cation
l.	lattice
$\lambda_{t,r}$	heat of transformation, fusion
r.t.	room temperature
m.pt., m.p.	melting point
n.	net (layer lattice)
sb.pt., s.p.	sublimation point
s.l.	super lattice
sol.	solution
str.	structure
tr.pt.	transformation point
< > []	The various parentheses and brackets enclosing chemical formulae refer to the state of aggregation, as defined on p. xviii. In the column "m.pt." and "b.pt." angular brackets < > around the melting temperature denote melting point under pressure, and around the boiling point denote the theoretical (extrapolated) boiling temperature of the substance, which is not normally attained owing to sublimation. Brackets [] around the melting temperature denote peritectic decomposition.

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
<Ag>	0		10.20 $\pm$ 0.05	125
<AgF>	-49.2 $\pm$ 0.9	907	20.0 $\pm$ 3.0	—
<AgF ₂ >	-85.9 $\pm$ 2.5	907	—	—
<AgCl>	-30.37 $\pm$ 0.02	key value	23.0 $\pm$ 0.05	key value
<AgBr>	-24.06 $\pm$ 0.2	907	25.6 $\pm$ 0.1	125
<AgBrO ₃ >	-6.3	907	36.8	907
<AgI> α	-14.8 $\pm$ 0.1	907	27.6 $\pm$ 0.4	125
<Ag ₂ O>	-7.3 $\pm$ 0.1	22	29.1 $\pm$ 0.3	125
<Ag ₂ S>	-7.6 $\pm$ 0.2	307	34.3 $\pm$ 0.4	635
<Ag ₂ SO ₄ >	-171.4 $\pm$ 0.15	907	47.76 $\pm$ 0.1	907
<Ag ₂ Se>	-10.4 $\pm$ 0.2	854	35.9 $\pm$ 0.2	854
<Ag ₂ Te>	-8.6 $\pm$ 0.1	854	36.7 $\pm$ 0.5	854
<Ag ₃ N>	+61.0 $\pm$ 3.0	81	—	—
<AgNO ₃ >	-29.76 $\pm$ 0.16	907	33.68 $\pm$ 0.1	907
<AgP ₂ >	-10.7 $\pm$ 2.0	307	(21.0)	307
<AgP ₃ >	-16.5 $\pm$ 2.5	307	(25.2)	307
<Ag ₂ CO ₃ >	-120.8 $\pm$ 2.0	138	40.0 $\pm$ 0.9	125
<Al>	0		6.77 $\pm$ 0.05	125
<Al>	+78.7 $\pm$ 0.5	99	39.3 $\pm$ 0.1	99
<AlH ₃ >	-2.75 $\pm$ 0.15	827	7.0 $\pm$ 1.1	—
<AlF>	-63.4 $\pm$ 0.8	817	51.4 $\pm$ 0.1	345
<AlF ₃ >	-361.0 $\pm$ 0.3	817	15.89 $\pm$ 0.1	379
<AlF ₃ >	-289.04 $\pm$ 0.16	817	66.15 $\pm$ 0.2	817
<Al ₂ F ₆ >	-629.45 $\pm$ 4.0	817	92.5 $\pm$ 3.0	817
<AlCl>	-12.3 $\pm$ 1.0	817	54.45 $\pm$ 0.03	817
<AlCl ₃ >	-168.65 $\pm$ 0.2	817	26.12 $\pm$ 0.1	817
<AlCl ₃ >	-139.7 $\pm$ 0.7	817	75.12 $\pm$ 1.0	817
<Al ₂ Cl ₆ >	-309.64 $\pm$ 0.8	817	113.65 $\pm$ 1.0	817
<AlBr>	+3.8 $\pm$ 3.0	817	57.25	817
<AlBr ₃ >	-122.15 $\pm$ 0.2	797	43.08 $\pm$ 0.3	817
<AlBr ₃ >	-98.2 $\pm$ 0.4	817	83.43 $\pm$ 0.3	817
<Al ₂ Br ₆ >	-231.3 $\pm$ 5.0	(907)	124.4 $\pm$ 4.0	(907)
<AlI>	+14.3 $\pm$ 2.0	817	59.24	817
<AlI ₃ >	-73.9 $\pm$ 1.5	817	45.3 $\pm$ 2.0	817
<AlI ₃ >	-49.0 $\pm$ 1.8	817	86.78	817
<Al ₂ I ₆ >	-121.0 $\pm$ 3.0	817	139.6	817
<AlOF>	-145.0 $\pm$ 3.5	903	55.97	817
<AlOCl>	-84.4 $\pm$ 2.5	903	59.47 $\pm$ 0.7	907
<AlOCl>	-189.6 $\pm$ 0.3	817	13.0 $\pm$ 1.0	817
<AlCl ₃ ·6H ₂ O>	-643.7 $\pm$ 0.9	(918)	76.03 $\pm$ 0.4	905
<Al ₂ O ₃ >	-400.9 $\pm$ 1.5	72	12.2 $\pm$ 0.1	129, 125
<Al ₂ O ₃ ·H ₂ O>	-479.0 $\pm$ 2.0	907	16.83 $\pm$ 0.07	907
<Al ₂ O ₃ ·3H ₂ O>	-618.2 $\pm$ 0.8	907	33.5 $\pm$ 0.2	907
<Al ₂ S ₃ >	-172.9 $\pm$ 4.0	113, 198	29.5 $\pm$ 3.3	—
<Al ₂ Se ₃ >	-129.0 $\pm$ 3.5	213, 113	37.5	—
<Al ₂ Te ₃ >	-76.2 $\pm$ 0.8	854	45.0 $\pm$ 4.0	—
<Al ₂ (SO ₄) ₃ >	-822.6 $\pm$ 0.5	907	57.17 $\pm$ 0.3	907
<AlN>	-76.1 $\pm$ 0.5	907	4.82 $\pm$ 0.03	907
<AlP>	-39.3 $\pm$ 0.7	907, 908	11.3 $\pm$ 1.0	907
<AlAs>	-29.3 $\pm$ 1.2	908	14.4 $\pm$ 1.0	907
<AlSb>	-12.0 $\pm$ 0.1	99	15.53 $\pm$ 0.1	99
<AlPO ₄ >	-414.2 $\pm$ 0.4	906	21.7 $\pm$ 0.1	54
<Al ₆ Si ₂ O ₁₃ >	+4.1 $\pm$ 0.5*	840	65.7 $\pm$ 0.1	840
<Al ₂ TiO ₅ >	-2.0 $\pm$ 2.0*	840	26.2 $\pm$ 0.2	303
<Al ₄ C ₃ >	-51.55 $\pm$ 2.0	817	21.2 $\pm$ 0.1	817
<AlB ₂ >	-16.0 $\pm$ 2.5	—	—	—
<AlB ₁₂ >	-48.0 $\pm$ 3.0	—	—	—

standard entropies and structures

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	960.8	2200	see Table Aa	
—	435	1150	NaCl (def.)	
—	(690)	—	—	
—	455	1550	NaCl	
—	424	1560	NaCl	
—	—	—	—	
136, 147, 430	554	1500	ZnS	
—	—	—	Cu ₂ O	
176, 586	830	—	ZnS	
427	660	—	Na ₂ SO ₄	
133	897	—	ZnS	
—	959	—	orthorhomb.	
—	—	—	f.c.c.	
160	210	—	—	
—	—	—	CuP ₂	
—	—	—	—	
—	—	—	—	
—	660	2520	Ag	
—	—	—	—	
—	—	—	hexagonal	
455	Sb	1276	rhombohed.	
—	—	—	—	
—	—	—	—	
—	(193)	181	hexagonal	
—	—	—	—	
—	—	—	—	
—	97	255	—	
—	—	—	—	
—	191	385	—	
—	—	—	—	
—	—	—	—	
1000	2050	—	Cr ₂ O ₃	
—	—	—	—	
—	1100	—	hexagonal	
—	950	—	wurtzite	
—	900	—	—	
—	—	—	orthorhomb.	
—	—	—	wurtzite	
—	1740	—	—	
—	1080	—	ZnS	
580, 705	2000	—	hexagonal	
—	1850	—	—	
—	1590	—	Ti ₃ O ₅	*from oxides, mullite
—	2200	—	—	*from oxides
—	[1975]	—	—	
—	[2070]	—	—	

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle 9\text{Al}_2\text{O}_3 \cdot 2\text{B}_2\text{O}_3 \rangle$	$-24.5 \pm 5.3^*$	840	156.3	840
$\langle \text{Al}_4\text{B}_2\text{O}_9 \rangle$	$-16.6 \pm 1.2^*$	840	37.2	—
$\langle \text{As} \rangle$	0	—	8.53 ± 0.1	99
$\langle \text{As}_2 \rangle$	$+52.82 \pm 1.7$	99	57.55	99
$\langle \text{As}_4 \rangle$	$+36.64 \pm 0.4$	99	78.23	99
$\langle \text{AsH}_3 \rangle$	$+15.9 \pm 4.0$	509	53.2 ± 0.05	325
$\langle \text{AsF}_3 \rangle$	-228.7 ± 0.8	907	43.3 ± 0.1	907
$\langle \text{AsF}_5 \rangle$	-220.2 ± 0.8	907	69.06 ± 0.1	907
$\langle \text{AsF}_3 \rangle$	-295.6 ± 2.0	392	75.8 ± 2.9	—
$\langle \text{AsCl}_3 \rangle$	-64.8	907	77.97 ± 0.15	907
$\langle \text{AsBr}_3 \rangle$	-31.57 ± 1.0	907	86.94 ± 0.1	907
$\langle \text{AsI}_3 \rangle$	-15.5	907	50.92	907
$\langle \text{As}_2\text{O}_3 \rangle$	-156.15 ± 0.8	380	29.33 ± 0.1	380
$\langle \text{As}_2\text{O}_5 \rangle$	-218.5 ± 1.5	—	25.2 ± 0.4	125
$\langle \text{As}_2\text{S}_3 \rangle$	-40.0 ± 5.0	854	39.1 ± 1.0	854
$\langle \text{AsS} \rangle$	-17.0 ± 5.0	854	15.15 ± 0.4	854
$\langle \text{As}_2\text{Se}_3 \rangle$	-24.5 ± 4.0	854	46.5 ± 0.8	854
$\langle \text{As}_2\text{Te}_3 \rangle$	-9.0 ± 1.5	854	54.1 ± 1.5	854
$\langle \text{Au} \rangle$	0	—	11.32 ± 0.05	67, 125
$\langle \text{Au} \rangle$	$+88.0 \pm 0.8$	99	43.115	99
$\langle \text{AuF}_3 \rangle$	-87.3 ± 8.0	418	27.3 ± 2.0	—
$\langle \text{AuCl} \rangle$	-8.3 ± 1.0	224, 198	22.2 ± 1.5	224
$\langle \text{AuCl}_3 \rangle$	-27.5 ± 1.0	224, 198	35.4 ± 1.5	224
$\langle \text{AuBr} \rangle$	-4.4 ± 1.0	198	27.0 ± 1.5	—
$\langle \text{AuI} \rangle$	$+0.2 \pm 1.0$	198	28.5 ± 2.0	—
$\langle \text{Au}_2\text{O}_3 \rangle$	(-0.8)	—	(31.15)	—
$\langle \text{AuTe}_2 \rangle$	-4.45 ± 0.7	753	33.87 ± 0.1	753
$\langle \text{Au}_2\text{P}_3 \rangle$	-23.3 ± 3.5	307	36.0 ± 3.0	307
$\langle \text{AuSb}_2 \rangle$	-4.65 ± 0.3	307	28.5 ± 0.3	307
$\langle \text{AuSn} \rangle$	-7.28 ± 0.3	136, 307	23.45 ± 0.7	307
$\langle \text{AuPb}_2 \rangle$	-1.5 ± 0.4	136, 307	41.9 ± 0.3	307
$\langle \text{Au}_2\text{Al} \rangle$	-25.0 ± 1.5	679	—	—
$\langle \text{AuAl} \rangle$	-18.5 ± 1.0	679	—	—
$\langle \text{AuAl}_2 \rangle$	-30.2 ± 1.0	679	—	—
$\langle \text{B} \rangle$	0	—	1.4 ± 0.05	105
$\langle \text{B} \rangle$	136.5 ± 0.8	99	36.65	99
$\langle \text{B} \rangle^\dagger$	1.0 ± 0.25	907	1.56 ± 0.03	105
$\langle \text{B}_2\text{H}_6 \rangle$	7.5 ± 0.3	702	55.3 ± 0.2	702
$\langle \text{BF}_3 \rangle$	-271.4 ± 0.3	692, 704	60.8 ± 0.5	125
$\langle \text{BCl}_3 \rangle$	-96.3 ± 2.0	817	69.3 ± 0.5	125
$\langle \text{BBr}_3 \rangle$	-57.0 ± 0.3	817	54.7 ± 2.0	817
$\langle \text{BBR}_3 \rangle$	-48.8 ± 0.3	817	77.49	817
$\langle \text{B}_2\text{O}_3 \rangle$	-304.0 ± 0.5	817	12.9 ± 0.1	128
$\langle \text{B}_2\text{O}_3 \rangle^\dagger$	-299.5 ± 0.7	817	18.75 ± 0.2	817
$\langle \text{H}_3\text{BO}_3 \rangle$	-261.5 ± 0.4	817, 907	21.21 ± 0.15	106
$\langle \text{B}_2\text{S}_4 \rangle$	-60.3 ± 2.0	854	22.0 ± 5.0	854
$\langle \text{BN} \rangle$	-60.3 ± 0.3	797	3.54 ± 0.04	907
$\langle \text{BP} \rangle$	-27.6 ± 1.4	798	6.4 ± 0.1	907
$\langle \text{B}_4\text{C} \rangle^\ddagger$	-17.1 ± 2.8	—	6.48 ± 0.04	907
$\langle \text{Ba} \rangle$	0	—	14.92 ± 0.2	99
$\langle \text{Ba} \rangle$	$+43.5 \pm 2.0$	99	40.66	99
$\langle \text{BaH}_2 \rangle$	-42.7 ± 1.0	57	15.4 ± 1.5	702
$\langle \text{BaF}_2 \rangle$	-288.5	198	23.03 ± 0.1	198
$\langle \text{BaCl}_2 \rangle$	-205.4 ± 0.6	57	29.55 ± 0.1	684

standard entropies and structures (contd.)

tr.pt. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	[1950]	—	—	*from oxides
—	[1035]	—	—	*from oxides
—	sb:	603	Table Aa	—
—	—	—	—	—
—	—	—	—	—
-167.6	-116.9	-62.5	—	—
—	-6	58	—	—
—	—	—	—	—
—	-80	-53	—	—
—	-16	130	—	—
—	31	221	—	—
—	141	371	Table Aa	—
—	—	—	Table Aa	—
267	312	565	—	—
—	307	—	—	—
—	377	—	—	—
—	375	—	—	—
—	1063	2860	Ag	—
—	—	—	—	—
—	288	—	—	—
—	288	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	464	—	—	—
—	—	—	—	—
—	460	—	pyrite	—
—	418	—	NiAs	—
—	[254]	—	CuAl ₂	—
—	624	—	—	—
—	[625]	—	—	—
—	1060	—	CaF ₂	—
—	2180	3800	various	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
-131	-129	-100	—	† amorph.
—	-107	12.5	—	—
—	-47	91	—	—
—	—	—	—	—
—	450	—	cubic	—
—	dec.	—	—	—
—	563	—	triclinic	† amorph.
—	2970	—	—	—
—	—	—	graphite	—
—	2350	—	—	† B ₇₋₄ C
—	729	(1700)	Na	—
—	—	—	—	—
—	—	—	—	—
—	1290	2215	—	—
922	962	—	CaF ₂	—

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{BaBr}_2 \rangle$	-180.5 ± 0.6	57	35.5 ± 5.0	155
$\langle \text{BaI}_2 \rangle$	-144.5 ± 0.8	57	39.47 ± 0.1	871
$\langle \text{BaO} \rangle^\dagger$	-132.3 ± 4.5	918	16.83 ± 0.3	125
$\langle \text{BaO}_2 \rangle$	-151.6 ± 2.8	824	22.25 ± 2.3	824
$\langle \text{Ba}(\text{OH})_2 \rangle$	-225.5 ± 1.8	918	24.1 ± 2.2	—
$\langle \text{BaS} \rangle$	-106.0 ± 3.0	854	18.7 ± 0.2	854
$\langle \text{BaSO}_4 \rangle$	-352.1 ± 4.0	198	31.6 ± 0.3	125
$\langle \text{BaSe} \rangle$	-94.0 ± 9.0	854	21.7 ± 2.0	854
$\langle \text{BaTe} \rangle$	-64.4 ± 7.0	182	23.8 ± 3.0	—
$\langle \text{Ba}_3\text{N}_2 \rangle$	-81.5 ± 7.5	—	36.4 ± 2.0	122
$\langle \text{Ba}(\text{NO}_3)_2 \rangle$	-237.1	918	51.1	918
$\langle \text{Ba}_3\text{P}_2 \rangle$	-118.0 ± 10.0	—	—	—
$\langle \text{Ba}_3\text{Sb}_2 \rangle$	-175.0 ± 10.0	153	—	—
$\langle \text{Ba}_3\text{Bi}_2 \rangle$	-160.0 ± 10.0	153	—	—
$\langle \text{BaC}_2 \rangle$	-17.7 ± 3.0	683	21.0 ± 2.0	683
$\langle \text{BaCO}_3 \rangle$	-290.7 ± 5.0	918	26.8 ± 0.5	125
$\langle \text{BaSiO}_3 \rangle$	$-38.0 \pm 1.0^*$	342	26.8 ± 1.5	—
$\langle \text{Ba}_2\text{SiO}_4 \rangle$	$-64.5 \pm 1.0^*$	342	43.5 ± 2.5	—
$\langle \text{BaTiO}_3 \rangle$	$-37.0 \pm 2.0^*$	840	25.8 ± 0.2	840
$\langle \text{Ba}_2\text{TiO}_4 \rangle$	$-46.0 \pm 3.0^*$	840	47.0 ± 0.5	840
$\langle \text{BaZrO}_3 \rangle$	$-28.6 \pm 5.0^*$	721	26.5 ± 2.0	—
$\langle \text{Ba}_2\text{Sn} \rangle$	-90.0 ± 8.0	153	30.3 ± 2.5	—
$\langle \text{BaSn}_3 \rangle$	-46.5 ± 4.5	153	45.0 ± 3.5	—
$\langle \text{Ba}_2\text{Pb} \rangle$	-70.0 ± 3.0	153	—	—
$\langle \text{BaPb} \rangle$	-36.0 ± 2.0	153	—	—
$\langle \text{BaPb}_3 \rangle$	-42.0 ± 2.5	153	—	—
$\langle \text{BaO} \cdot \text{Al}_2\text{O}_3 \rangle$	$-24.0 \pm 1.5^*$	318	35.5 ± 2.2	—
$\langle 3\text{BaO} \cdot \text{Al}_2\text{O}_3 \rangle$	$-45.0 \pm 2.0^*$	318	—	—
$\langle \text{BaHfO}_3 \rangle$	$-30.7 \pm 4.0^*$	845	29.2 ± 3.2	—
$\langle \text{BaMoO}_4 \rangle$	$-49.8 \pm 2.5^*$	840	34.5 ± 1.5	840
$\langle \text{BaUO}_4 \rangle$	$-49.0 \pm 4.0^*$	—	40.3 ± 2.9	—
$\langle \text{Be} \rangle$	0	—	2.27 ± 0.2	755
$\langle \text{Be} \rangle$	$+77.5 \pm 1.5$	755	32.54	755
$\langle \text{BeH}_2 \rangle$	-4.55 ± 0.5	755	4.2 ± 1.0	702
$\langle \text{BeF} \rangle$	-41.8 ± 2.5	755	49.15 ± 0.2	755
$\langle \text{BeF}_2 \rangle$	-245.4 ± 1.0	755	12.75 ± 0.1	755
$\langle \text{BeCl} \rangle$	$+2.0 \pm 1.0$	496	53.0 ± 2.5	496
$\langle \text{BeCl}_2 \rangle$	-118.6 ± 0.8	755	18.12 ± 0.05	755
$\langle \text{BeCl}_2 \rangle$	-86.1 ± 2.5	755	60.0 ± 1.0	755
$\langle \text{Be}_2\text{Cl}_4 \rangle$	(-196.3)	755	92.5 ± 2.0	755
$\langle \text{BeBr}_2 \rangle$	-84.5	755	25.4 ± 2.0	755
$\langle \text{BeI}_2 \rangle$	-46.0	755	28.8 ± 2.0	755
$\langle \text{BeO} \rangle$	-145.4 ± 0.8	755	3.38 ± 0.05	755
$\langle \text{Be}(\text{OH})_2 \rangle$	-216.5 ± 0.5	755	12.6 ± 1.0	—
$\langle \text{BeOH} \rangle$	-47.5 ± 7.0	755	53.28	817
$\langle \text{BeS} \rangle$	-55.8 ± 1.0	755	8.4 ± 1.5	—
$\langle \text{BeSO}_4 \rangle_\alpha$	-287.0 ± 0.8	755	18.64 ± 0.2	755
$\langle \text{BeSO}_4 \cdot 2\text{H}_2\text{O} \rangle$	-435.7	918	39.01	918
$\langle \text{Be}_3\text{N}_2 \rangle_\alpha$	-140.9 ± 0.6	755	8.20 ± 0.08	755
$\langle \text{Be}_2\text{C} \rangle$	-28.0 ± 0.5	755	3.9 ± 0.8	755
$\langle \text{Be}_2\text{SiO}_4 \rangle$	$-4.7 \pm 0.5^*$	755	15.37 ± 0.2	755
$\langle \text{Be}_3\text{B}_2\text{O}_6 \rangle$	$-13.38 \pm 0.5^\dagger$	755	22.1 ± 3.0	755
$\langle \text{BeAl}_2\text{O}_4 \rangle$	-549.4 ± 3.3	755	15.84 ± 0.1	755
$\langle \text{BeAl}_6\text{O}_{10} \rangle$	-1342.6 ± 5.5	755	42.0	755
$\langle \text{Bi} \rangle$	0	—	13.55 ± 0.1	471
$\langle \text{Bi} \rangle$	$+50.1 \pm 0.5$	99	44.67	99
$\langle \text{Bi}_2 \rangle$	$+52.6$	99	65.4	99

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	854	—	PbCl_2	$\dagger \text{BaO}_{0.907-1.09}$
—	712	—	BaCl_2	
—	1920	—	BaCl_2	
—	—	(2750)	BaCl_2BaCl	
—	408	—	CaC_2	
—	—	—	—	orthorhomb.
—	(2400)	—	NaCl	
1150	1350	—	orthorhomb.	
—	—	—	NaCl	
—	2070	—	NaCl	
—	—	—	pseudo-hexag.	—
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
806, 968	—	—	—	orthorhomb.
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
5, 120	1760	—	—	K_2SO_4
120	1615	—	—	
—	1860	—	tetragonal	
—	—	—	—	
—	—	—	—	
—	700	—	—	—
—	928	—	—	
—	—	—	—	
—	617	—	—	
330	1830	—	hexagonal	
—	—	—	—	—
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
1254	1287	2472	Mg	—
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
227	552	1175	tetragonal	—
—	—	—	—	
403	415	532	—	
—	—	—	—	
—	—	—	—	
—	488	521	—	tetragonal
350	480	482	wurtzite	
—	2580	—	—	
—	—	—	—	
—	—	—	—	
590, 635	—	—	ZnS	—
—	—	—	—	
—	—	—	—	
157	2100	—	Sc_2O_3	
—	—	—	CaF_2	
—	—	—	rhombohed.	*from oxides $\dagger$ from $\langle \text{BeO} \rangle$ and $\langle \text{B}_2\text{O}_3 \rangle$ glass
—	—	—	—	
—	1495	—	—	
—	1870	—	—	
—	271	1564	As	
—	—	—	—	—
—	—	—	—	—

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	—	—	—	
—	649	—	Table Aa	
—	—	—	—	
—	—	—	—	
—	234	441	—	
—	—	—	—	
—	219	461	—	
291	—	—	—	
—	409	—	AsI ₃	
705	824	—	monoclinic	
—	767	—	orthorhomb.	
—	—	—	—	
—	722	—	—	
—	597	—	rhombohed.	
—	—7	61	solid: I ₂	
—	—	—	—	
—	—	—	—	
—	—	—	Table Aa	
—	—	—	Table Aa	
—	—	—	—	
—197	—184	—151	—	
—48	—23	77	—	
—	—	—	—	
—	—	—	—	
—	—128	7.5	—	
—212	—205	—192	—	
—	—	—79	—	
—	—	—	—	
—	—112	46	—	
—	—	—	—	
—	—139	—50	—	
—	—	—	—	
448	839	1484	Ag	
—	—	—	—	
—	—	—	—	
780	816	—	PbCl ₂	
1151	1418	2510	Table A2a	
—	772	(2000)	TiO ₂ (def.)	
—	—	—	—	
—	742	(1800)	TiO ₂ (def.)	
—	777	—	CdI ₂	
—	2615	(3500)	NaCl	
—	—	—	CaC ₂	
—	—	—	CdI ₂	
—	—	—	orthorhomb.	
—	—	—	—	
1193	(1400)	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	NaCl	
—	—	—	NaCl	
—	1195	—	pseudo-hexag.	
—	1320	—	—	
1140	1353	—	—	
1100	—	—	—	
—	—	—	—	

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{CaV}_2\text{O}_6 \rangle$	$-34.3 \pm 0.5^*$	711	42.8 ± 0.5	711
$\langle \text{Ca}_2\text{V}_2\text{O}_7 \rangle$	$-62.7 \pm 0.6^*$	711	52.7 ± 0.5	711
$\langle \text{Ca}_3\text{V}_2\text{O}_8 \rangle$	$-77.0 \pm 0.8^*$	711	65.7 ± 0.6	711
$\langle \text{Ca}_3\text{Sb}_2 \rangle$	-174.0 ± 9.0	153	37.6 ± 4.5	—
$\langle \text{Ca}_3\text{Bi}_2 \rangle$	-126.0 ± 7.5	153	42.5	—
$\langle \text{CaC}_2 \rangle$	-14.1 ± 2.0	189	16.8 ± 0.5	125
$\langle \text{CaCO}_3 \rangle$	-288.51 ± 0.7	138	$21.2 \pm 0.3^\dagger$	125
	-288.46	—	$22.2 \pm 0.2^\dagger$	125
$\langle \text{CaSi} \rangle$	-36.0 ± 2.0	153	—	—
$\langle \text{CaSi}_2 \rangle$	-36.0 ± 3.0	153	—	—
$\langle \text{Ca}_2\text{Si} \rangle$	-50.0 ± 3.0	153	—	—
$\langle \text{CaSiO}_3 \rangle$	-21.3 ± 0.3	193	19.6 ± 0.3	125
$\langle \text{Ca}_2\text{SiO}_4 \rangle$	$-32.7 \pm 2.0^*$	840	28.8 ± 0.2	840
$\langle \text{Ca}_3\text{SiO}_5 \rangle$	$-27.0 \pm 1.5^*$	131, 193, 352	40.3 ± 0.3	243
$\langle \text{CaMgSiO}_4 \rangle$	$-27.6 \pm 1.5^*$	389	26.4 ± 1.0	—
$\langle \text{CaAl}_2 \rangle$	-51.8 ± 4.0	99	20.4 ± 2.5	—
$\langle \text{CaAl}_4 \rangle$	-52.2 ± 4.0	99	33.0 ± 4.0	—
$\langle \text{Ca}_3\text{Al}_2\text{O}_6 \rangle$	$-2.0 \pm 0.8^*$	840	49.1 ± 0.3	304
$\langle \text{CaAl}_2\text{O}_4 \rangle$	$-3.6 \pm 0.3^*$	840	27.25 ± 0.2	840
$\langle \text{CaAl}_4\text{O}_7 \rangle$	$-3.0 \pm 0.5^*$	840	42.5 ± 0.3	304
$\langle \text{Ca}_2\text{Sn} \rangle$	-75.0 ± 4.5	153	24.0 ± 2.6	—
$\langle \text{CaSn} \rangle$	-38.0 ± 2.5	153	16.9 ± 1.9	—
$\langle \text{CaSn}_3 \rangle$	-43.0 ± 4.0	264	—	—
$\langle \text{Ca}_2\text{Pb} \rangle$	-51.5 ± 2.5	264	25.2 ± 2.5	147
$\langle \text{CaPb} \rangle$	-28.6 ± 1.5	264	19.3 ± 2.5	—
$\langle \text{CaO} \cdot 2\text{B}_2\text{O}_3 \rangle$	$-42.9 \pm 1.0^*$	193	32.2 ± 0.3	125
$\langle \text{CaO} \cdot \text{B}_2\text{O}_3 \rangle$	$-29.4 \pm 1.0^*$	193	25.1 ± 0.2	125
$\langle 2\text{CaO} \cdot \text{B}_2\text{O}_3 \rangle$	$-45.8 \pm 1.0^*$	193	34.7 ± 0.2	125
$\langle 3\text{CaO} \cdot \text{B}_2\text{O}_3 \rangle$	$-60.0 \pm 1.0^*$	193	43.9 ± 0.3	125
$\langle \text{CaTi} \rangle$	-39.0 ± 3.0	153, 264	—	—
$\langle \text{CaMg}_2 \rangle$	-9.4 ± 0.4	840	24.53 ± 0.25	840
$\langle \text{CaOMgO} \rangle$	$-1.8 \pm 0.3^*$	840	15.85 ± 0.4	840
$\langle \text{CaTiO}_3 \rangle$	$-19.3 \pm 0.9^*$	840	22.4 ± 0.2	125
$\langle \text{Ca}_3\text{Ti}_2\text{O}_7 \rangle$	-50.0^*	840	56.1 ± 0.5	840
$\langle \text{Ca}_4\text{Ti}_3\text{O}_{10} \rangle$	-71.0^*	840	78.5 ± 2.0	840
$\langle \text{CaZrO}_3 \rangle$	$-7.3 \pm 2.0^*$	840	22.4 ± 2.0	840
$\langle \text{CaHfO}_3 \rangle$	-7.5^*	137	24.0 ± 2.2	—
$\langle \text{CaMoO}_4 \rangle$	$-39.8 \pm 1.0^*$	840	29.3 ± 0.2	637
$\langle \text{CaWO}_4 \rangle$	$-34.9 \pm 2.5^*$	840	30.2 ± 0.2	546
$\langle \text{CaUO}_4 \rangle$	$-32.0 \pm 4.0^*$	—	34.2 ± 2.7	—
$\langle \text{CaFe}_2\text{O}_5 \rangle$	$-9.6 \pm 1.0^*$	840	45.1 ± 0.3	378
$\langle \text{Ca}_2\text{Fe}_2\text{O}_4 \rangle$	-5.0 ± 2.5	840	34.7 ± 0.2	378
$\langle \text{CaZn} \rangle$	-17.5 ± 2.0	264	15.9 ± 1.8	—
$\langle \text{CaZn}_2 \rangle$	-22.5 ± 2.5	264	24.3 ± 2.4	—
$\langle \text{CaZn}_5 \rangle$	-33.0 ± 3.0	264	—	—
$\langle \text{CaSnO}_3 \rangle$	$-17.4 \pm 0.5^*$	814	20.0 ± 0.5	814
$\langle \text{CaSnO}_4 \rangle$	$-17.1 \pm 0.5^*$	814	30.65 ± 0.5	814
$\langle \text{Cd} \rangle$	0	—	12.38 ± 0.05	99
$\langle \text{Cd} \rangle$	$+26.72 \pm 0.15$	99	40.065	99
$\langle \text{CdF}_2 \rangle$	-167.4 ± 0.5	907	20.0 ± 2.0	907
$\langle \text{CdCl}_2 \rangle$	-93.4 ± 0.3	907	27.55 ± 0.1	907
$\langle \text{CdBr}_2 \rangle$	-75.35 ± 0.4	907	33.18 ± 0.1	907
$\langle \text{CdI}_2 \rangle$	-48.8 ± 0.8	907	37.84 ± 0.25	907
$\langle \text{CdO} \rangle$	-62.0 ± 0.4	916	13.1 ± 0.2	125, 165
$\langle \text{CdS} \rangle$	-35.7 ± 0.5	854	16.5 ± 0.5	165, 125
$\langle \text{CdSO}_4 \rangle$	-222.0 ± 0.6	860	29.4 ± 0.15	393

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	778	—	—	*from oxides
—	1015	—	—	*from oxides
—	1380	—	—	*from oxides
—	1350	—	—	—
—	930	—	—	—
447	2300	—	Table Aa	—
50	—	—	$\text{BaCO}_3^\dagger$	$\dagger$ aragonite
—	—	—	$\text{MgCO}_3^\dagger$	$\dagger$ calcite
—	1240	—	orthorhomb.	—
—	—	—	rhombohed.	—
—	—	—	PbCl_2	—
1190	1544	—	triclinic	—
675, 1420	2130	—	Na_2BeF_4	*from oxides
—	—	—	—	*from oxides
—	—	—	—	*from oxides
—	1080	—	—	—
—	777	—	—	—
—	(1535)	—	cubic	*from oxides
—	1605	—	—	*from oxides
—	(1535)	—	—	*from oxides
—	1122	—	—	—
—	987	—	CaSi	—
—	627	—	Ag: sup. str.	—
—	1110	—	—	—
—	950	—	—	—
—	990	—	—	*from oxides
—	1160	—	—	*from oxides
—	1310	—	—	*from oxides
—	1490	—	—	*from oxides
—	—	—	CsCl	—
—	714	—	MgZn_2	*from oxides
—	—	—	—	*from oxides
1260	—	—	orthorhomb.	*from oxides
—	(1725)	—	—	*from oxides
—	(1755)	—	—	*from oxides
—	2340	—	—	*from oxides
—	—	—	—	*from oxides
—	—	—	—	*from oxides
546	1580	—	—	*from oxides
752	—	—	—	*from oxides
—	1450	—	—	*from oxides
—	(1216)	—	—	*from oxides
—	430	—	—	—
—	690	—	—	—
—	680	—	hexagonal	—
—	—	—	—	*from oxides
—	—	—	—	*from oxides
—	321	767	c. Mg	—
—	—	—	—	—
—	1072	1750	CaF_2	—
—	569	960	Table Aa	—
—	568	863	CdCl_2	—
322	388	796	Table Aa	—
—	Sb	1497	NaCl	—
—	1405	—	wurtzite	—
—	1000	—	—	—

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{CdSe} \rangle$	-34.6 ± 3.0	854	19.9 ± 0.5	854
$\langle \text{CdSeO}_3 \rangle$	-139.1 ± 1.3	907	28.7 ± 2.0	907
$\langle \text{CdTe} \rangle$	-24.33 ± 0.2	99	22.24 ± 0.6	99
$\langle \text{Cd}_3\text{N}_2 \rangle$	38.6 ± 3.0	264	—	—
$\langle \text{Cd}_3\text{As}_2 \rangle$	-9.1 ± 2.0	898	49.5 ± 2.5	898
$\langle \text{CdSb} \rangle^\dagger$	-3.19 ± 0.3	758	22.85 ± 0.15	758
$\langle \text{CdCO}_3 \rangle$	-179.7 ± 2.0	860	22.1 ± 1.2	860
$\langle \text{CdSiO}_3 \rangle$	-4.8 ± 0.5	840	23.3 ± 0.3	840
$\langle \text{CdTiO}_3 \rangle$	$-6.6 \pm 0.2^*$	840	25.1 ± 1.0	840
$\langle \text{CdAl}_2\text{O}_4 \rangle$	$+3.6 \pm 0.7^*$	840	29.9 ± 4.0	—
$\langle \text{CdGa}_2\text{O}_4 \rangle$	-324.1 ± 1.4	840	33.4 ± 2.4	—
$\langle \text{CdWO}_4 \rangle$	$-18.9 \pm 1.8^*$	840	37.0 ± 2.5	—
$\langle \text{Ce} \rangle$	0	—	17.2	918
$\langle \text{Ce} \rangle$	$+101.0 \pm 3.0$	99	45.81	—
$\langle \text{CeH}_2 \rangle$	-49.0	918	13.33 ± 0.08	759
$\langle \text{CeF}_3 \rangle$	-425.0 ± 15.0	—	27.55 ± 0.2	—
$\langle \text{CeCl}_3 \rangle$	-252.8 ± 2.0	233, (18)	35.8 ± 1.8	—
$\langle \text{CeI}_3 \rangle$	-155.3 ± 2.2	918	51.3 ± 3.5	—
$\langle \text{Ce}_2\text{O}_3 \rangle$	-435.4 ± 0.9	—	36.0 ± 1.0	—
$\langle \text{CeO}_2 \rangle$	-260.5 ± 0.4	—	14.9 ± 0.1	—
$\langle \text{CeS} \rangle$	-109.1 ± 2.5	854	18.7 ± 0.3	125
$\langle \text{Ce}_3\text{S}_4 \rangle$	-395.0 ± 3.0	854	61.0 ± 3.0	854
$\langle \text{Ce}_2\text{S}_3 \rangle$	-284.0 ± 3.0	854	43.1 ± 0.5	854
$\langle \text{Ce}_2(\text{SO}_4)_3 \rangle$	-944.5 ± 2.0	767	68.7 ± 6.0	—
$\langle \text{CeN} \rangle$	-78.0 ± 6.0	264, 198	—	—
$\langle \text{Ce}_2\text{C}_3 \rangle$	-42.2 ± 1.8	756	41.5 ± 4.0	—
$\langle \text{CeC}_2 \rangle$	-23.2 ± 1.7	756	21.5 ± 2.0	—
$\langle \text{CeB}_6 \rangle$	-84.0 ± 23.0	—	17.7 ± 3.5	—
$\langle \text{CeAlO}_3 \rangle$	-421.4 ± 4.0	843	25.5 ± 3.5	843
$\langle \text{CeAl}_4 \rangle$	-39.0 ± 3.0	264	38.7	—
$\langle \text{CeAl}_2 \rangle$	-39.0 ± 4.0	264	27.1	—
$\langle \text{Cl}_2 \rangle$	0	—	53.29 ± 0.01	key value
$\langle \text{Cl} \rangle$	$+28.99 \pm 0.01$	key value	39.45 ± 0.01	key value
$\langle \text{Co} \rangle$	0	—	7.18 ± 0.1	99
$\langle \text{Co} \rangle$	$+102.4 \pm 1.0$	99	42.88	99
$\langle \text{CoF}_2 \rangle$	-165.4 ± 2.4	918	19.59 ± 0.1	918
$\langle \text{CoF}_3 \rangle$	-193.8 ± 5.0	918	22.8 ± 2.8	—
$\langle \text{CoCl}_2 \rangle$	-74.1 ± 0.8	907	26.21 ± 0.05	907
$\langle \text{CoBr}_2 \rangle$	-52.8 ± 2.7	918	32.0 ± 2.0	—
$\langle \text{CoI}_2 \rangle$	-21.2 ± 2.5	918	36.6 ± 2.5	—
$\langle \text{CoO} \rangle$	-57.1 ± 0.5	349, 22	12.65 ± 0.1	379
$\langle \text{Co}_3\text{O}_4 \rangle$	-216.3 ± 3.0	—	24.5 ± 0.2	379
$\langle \text{Co}(\text{OH})_2 \rangle$	-129.4 ± 1.5	792	22.3 ± 0.4	792
$\langle \text{CoS}_{0.89} \rangle$	-22.6 ± 1.0	854	12.5 ± 0.8	854
$\langle \text{CoS}_{1.33} \rangle$	-28.6 ± 2.0	854	14.7 ± 2.0	854
$\langle \text{CoS}_2 \rangle$	-36.6 ± 4.0	854	16.5 ± 1.5	854
$\langle \text{CoSO}_4 \rangle$	-212.0 ± 0.6	860	27.1	860
$\langle \text{CoSeO}_3 \rangle$	-139.1 ± 2.0	907	27.2 ± 2.0	907
$\langle \text{Co}_3\text{N} \rangle$	$+2.0 \pm 4.0$	82	23.6 ± 1.5	—
$\langle \text{Co}_2\text{P} \rangle$	-44.8 ± 3.5	264	18.5 ± 3.5	—
$\langle \text{CoP} \rangle$	-30.0 ± 5.0	264	12.0	—
$\langle \text{CoP}_3 \rangle$	-48.9 ± 5.0	264	23.5	—
$\langle \text{CoAs}_2 \rangle$	-26.6 ± 3.0	139	53.3 ± 3.0	139
$\langle \text{Co}_2\text{As} \rangle$	-13.5 ± 1.5	139	23.0 ± 2.0	139
$\langle \text{Co}_3\text{As}_3 \rangle$	-27.2 ± 3.0	139	38.3 ± 2.5	139
$\langle \text{CoAs} \rangle$	-13.6 ± 1.5	139	15.4 ± 1.0	139
$\langle \text{Co}_2\text{As}_3 \rangle$	-34.4 ± 3.0	139	39.2 ± 3.0	139

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	1264	—	wurtzite	—
—	680	—	—	—
—	1091	—	ZnS	—
—	—	—	SC ₂ O ₃	—
578	721	—	tetragonal	—
—	456	—	orthorhomb.	†CdSb _{0.99-1.0} (250°C)
—	—	—	MgCO ₃	—
—	1785	—	—	—
830	—	—	—	*from oxides
—	—	—	—	*from oxides
—	—	—	—	—
—	—	—	—	*from oxides
726	798	3424	Mg	—
—	—	—	—	—
—	—	—	—	—
—	1437	—	hexagonal	—
—	800	1731	UCl ₃	—
—	760	—	—	—
—	—	—	La ₂ O ₃	—
—	—	—	CaF ₂	—
—	2450	—	NaCl	—
—	2050	—	—	—
—	1890	—	cubic	—
—	—	—	—	—
—	2560	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	2000	—	—	—
—	—	—	—	—
1005	1245	—	tetragonal	—
—	1460	—	Table Aa	—
—	—101	—34	—	—
—	—	—	—	—
434	1495	2930	Mg	—
—	—	—	—	—
—	1250	—	rutile	—
—	—	—	FeF ₃	—
—	740	1053	CdCl ₂	—
—	676	—	CdI ₂	—
—	520	—	CdI ₂	—
—	1805	—	NaCl	—
—	—	—	spinel	—
—	—	—	—	—
—	[835]	—	cubic	—
—	[625]	—	—	—
—	—	—	pyrite	—
—	—	—	—	—
—	659	—	—	—
—	—	—	hexag. c.p.†	†metastable
—	—	—	hexag. (def.)	—
—	—	—	orthorhomb.	—
—	—	—	—	—
—	923	—	—	—
—	958	—	—	—
—	[1014]	—	—	—
—	1180	—	CoP	—
—	—	—	—	—

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{CoAs}_2 \rangle$	-22.0 ± 2.5	139	22.2 ± 2.0	139
$\langle \text{CoSb} \rangle^\ddagger$	-10.0 ± 0.8	264	16.9 ± 1.3	790
$\langle \text{Co}_3\text{C} \rangle$	4.0 ± 4.0	189	17.8 ± 2.5	189
$\langle \text{CoCO}_3 \rangle$	-170.0 ± 3.5	886	21.2 ± 0.4	833
$\langle \text{Co}_2\text{Si} \rangle$	-28.0 ± 2.5	840	—	—
$\langle \text{CoSi} \rangle$	-22.7 ± 2.0	840	10.2 ± 0.7	840
$\langle \text{CoSi}_2 \rangle$	-23.6 ± 2.5	840	15.3 ± 1.0	840
$\langle \text{Co}_2\text{B} \rangle$	-30.0 ± 7.0	—	14.3 ± 3.0	—
$\langle \text{CoB} \rangle$	-22.5 ± 4.0	—	7.3 ± 1.6	—
$\langle \text{CoSn} \rangle$	-7.0 ± 1.0	264	17.1 ± 2.5	—
$\langle \text{CoAl} \rangle^\S$	-26.4 ± 2.0	264	—	—
$\langle \text{Co}_2\text{Al}_5 \rangle$	-70.0 ± 5.0	264	—	—
$\langle \text{CoAl}_4 \rangle^\parallel$	-38.5 ± 3.0	264	—	—
$\langle \text{CoTiO}_3 \rangle$	$-5.9 \pm 1.0^*$	840	23.15	840
$\langle \text{CoWO}_4 \rangle$	$-14.8 \pm 0.9^*$	840	30.2 ± 2.2	840
$\langle \text{CoAl}_2\text{O}_4 \rangle$	$-8.0 \pm 0.7^*$	813	23.8 ± 0.7	813
$\langle \text{CoCr}_2\text{O}_4 \rangle$	$-14.3 \pm 0.5^*$	840, 813	30.3 ± 0.2	840, 813
$\langle \text{CoFe}_2\text{O}_4 \rangle$	$-6.6 \pm 0.6^*$	840	34.1 ± 2.0	840
$\langle \text{Cr} \rangle$	0	—	5.65 ± 0.05	99
$\langle \text{Cr} \rangle$	$+95.0 \pm 1.0$	99	41.63	99
$\langle \text{CrF}_2 \rangle$	-186.3 ± 3.0	918	20.0 ± 3.0	27
$\langle \text{CrF}_3 \rangle$	-266.0 ± 5.0	27, 260	22.45 ± 0.1	512
$\langle \text{CrF}_4 \rangle$	-286.5 ± 6.0	260	—	—
$\langle \text{CrCl}_2 \rangle$	-94.5 ± 3.0	918	27.55 ± 0.1	625
$\langle \text{CrCl}_3 \rangle$	-133.0 ± 4.0	918	29.4 ± 0.1	512
$\langle \text{CrBr}_2 \rangle$	-72.2 ± 5.0	918	32.2 ± 1.7	—
$\langle \text{CrI}_2 \rangle$	-37.8 ± 1.4	295, (198)	—	—
$\langle \text{CrI}_3 \rangle$	-49.0 ± 1.6	918	47.7 ± 2.6	—
$\langle \text{CrO}_2\text{Cl}_2 \rangle$	-128.6 ± 3.0	918	78.7	918
$\langle \text{Cr}_2\text{O}_3 \rangle^\ddagger$	-270.0 ± 2.5	198, 22, 311	19.4 ± 0.2	125
$\langle \text{CrO}_2 \rangle$	-139.2 ± 2.0	340	12.2 ± 2.1	—
$\langle \text{CrO}_3 \rangle$	-138.5 ± 2.5	198, 22	17.2 ± 2.5	—
$\langle \text{CrS} \rangle$	-37.2 ± 2.5	856	15.3 ± 1.5	854
$\langle \text{Cr}_2\text{S}_3 \rangle$	(-87)	854	(35.6)	854
$\langle \text{Cr}_2(\text{SO}_4)_3 \rangle$	-695.7 ± 3.5	911	61.85 ± 0.5	912
$\langle \text{CrN} \rangle^*$	-29.4 ± 0.8	—	78.5 ± 0.8	—
$\langle \text{Cr}_4\text{C} \rangle$	-23.5 ± 2.0	99	25.3 ± 0.3	125
$\langle \text{Cr}_7\text{C}_3 \rangle$	-54.5 ± 2.5	99	48.0 ± 0.3	125
$\langle \text{Cr}_3\text{C}_2 \rangle$	-26.2 ± 2.0	99	20.4 ± 0.2	125
$\langle \text{Cr}(\text{CO})_6 \rangle$	-222.0	914	76.5 ± 0.8	—
$\langle \text{Cr}_3\text{Si} \rangle$	-22.0 ± 3.8	769	20.6 ± 1.5	769
$\langle \text{Cr}_5\text{Si}_3 \rangle$	-50.5 ± 7.5	769	40.4 ± 3.0	769
$\langle \text{CrSi} \rangle$	-12.7 ± 2.0	769	10.5 ± 0.8	769
$\langle \text{CrSi}_2 \rangle$	-19.1 ± 3.0	769	14.0 ± 1.1	769
$\langle \text{CrB} \rangle$	-18.0	—	5.75	—
$\langle \text{CrB}_2 \rangle$	-22.5	—	6.25	—
$\langle \text{Cr}_2\text{N} \rangle^\ddagger$	-27.3 ± 0.8	—	17.7 ± 1.0	—
$\langle \text{Cs} \rangle$	0	—	20.37 ± 0.1	key value
$\langle \text{CsF} \rangle$	-132.6 ± 0.5	817	21.1 ± 2.0	817
$\langle \text{CsF} \rangle$	-85.2 ± 0.5	817	58.1 ± 0.01	817
$\langle \text{CsCl} \rangle$	-105.8 ± 0.4	817	24.18 ± 0.01	817
$\langle \text{CsCl} \rangle$	-57.4 ± 1.0	817	61.175	817
$\langle \text{CsBr} \rangle$	-94.3 ± 3.0	198	27.1 ± 1.5	177
$\langle \text{CsI} \rangle$	-80.5 ± 2.5	198	30.0 ± 2.5	—
$\langle \text{Cs}_2\text{O} \rangle$	-75.9 ± 3.0	22, 198	30.5 ± 2.5	—
$\langle \text{Cs}_2\text{O}_3 \rangle$	-135.0 ± 2.0	22	56.0 ± 5.0	—

standard entropies and structures (contd.)

tr. pts. (°C)	m. pt. (°C)	b. pt. (°C)	Structure	Remarks
—	—	—	marcasite	
—	1193	—	NiAs	$\ddagger \text{CoSb}_{0.74-0.96}$
—	—	—	orthorhomb.	
—	1330	—	MgCO ₃	
—	1460	—	—	
—	1327	—	CaF ₂	
—	1265	—	—	
—	[1110]	—	—	
525	[936]	—	NiAs(def.)	$\S \text{CoAl}_{1.0-1.3} (25^\circ\text{C})$
—	1628	—	CsCl	
—	—	—	—	$\P \text{CoAl}_{4.6}$
—	—	—	—	*from oxides
—	—	—	—	*from oxides
—	—	—	—	*from oxides
—	—	—	—	*from oxides
—	—	—	—	*from oxides
—	1857	2672	—	
—	—	—	—	
—	1100	—	—	
—	1100	—	—	
—	—	—	—	
—	815	1300	orthorhomb.	
—	Sb	945	—	
—	842	—	monoclinic	
—	792	—	—	
—	—	—	—	
—	-95	117	—	
—	(2400)	—	Table Aa	$\ddagger \text{CrO}_{1.5-1.54}$
—	185	—	—	
(200)	1567	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	NaCl	
—	1520	—	cubic	
—	1780	—	hexagonal	
—	1890	—	orthorhombic	
—	151	—	—	
—	1770	—	—	
—	1647	—	—	
—	—	—	—	
—	1457	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	Cr = Mg	$\ddagger \text{CrN}_{0.38-0.50}$
—	30	—	Na	
—	703	1270	NaCl	
—	—	—	—	
470	645	1324	Table Aa	
—	—	—	—	
—	639	1300	CsCl	
—	626	1280	CsCl	
—	(490)	—	CdCl ₂	
—	502	—	Cs ₄ (O ₂) ₃ : cubic	

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{CsO}_2 \rangle$	-76.0 ± 8.0	22	35.0 ± 3.5	—
$\langle \text{Cs}_2\text{S} \rangle$	-81.1 ± 8.0	198	—	—
$\langle \text{Cs}_2\text{SO}_4 \rangle$	-339.4 ± 6.0	198	49.6 ± 4.1	—
$\langle \text{Cs}_2\text{CO}_3 \rangle$	-274.2 ± 2.5	919	48.87 ± 0.1	872
$\langle \text{Cu} \rangle$	0	—	7.92 ± 0.05	99
$\langle \text{Cu} \rangle$	$+80.5 \pm 0.3$	99	39.74 ± 0.02	99
$\langle \text{CuF}_2 \rangle$	-131.2 ± 3.0	812	16.4 ± 1.0	817
$\langle \text{CuCl} \rangle$	-32.8 ± 0.7	918	20.6 ± 0.4	918
$\langle \text{CuCl}_2 \rangle$	-52.0 ± 2.0	918	25.83 ± 0.1	625
$\langle \text{CuBr} \rangle$	-24.9 ± 0.3	93, 198	23.0 ± 0.2	93, 125
$\langle \text{CuBr}_2 \rangle$	-33.9 ± 2.2	918	32.0 ± 1.7	—
$\langle \text{CuI} \rangle^\dagger$	-16.2 ± 1.0	198	23.1 ± 0.3	125
$\langle \text{Cu}_2\text{O} \rangle$	-40.0 ± 0.7	22, 198, 165	22.25 ± 0.1	93, 165, 501
$\langle \text{CuO} \rangle$	-37.1 ± 0.8	22, 198	10.2 ± 0.05	93, 125
$\langle \text{Cu}_2\text{S} \rangle^\ddagger$	-19.0 ± 0.3	854	28.9 ± 0.5	854
$\langle \text{CuS} \rangle$	-12.5 ± 1.0	854	15.9 ± 0.5	125
$\langle \text{Cu}_2\text{SO}_4 \rangle$	-179.2	859	43.6	—
$\langle \text{CuSO}_4 \rangle$	-184.25 ± 0.3	907	26.1 ± 0.1	907
$\langle \text{Cu}_2\text{Se} \rangle^\S$	-15.6 ± 1.5	854	31.0 ± 1.0	854
$\langle \text{CuSe} \rangle$	-10.0 ± 1.0	854	18.7 ± 1.5	854
$\langle \text{Cu}_2\text{Te} \rangle$	-10.0 ± 2.5	854	32.2 ± 2.0	854
$\langle \text{Cu}_3\text{N} \rangle$	-17.8 ± 3.0	198	—	—
$\langle \text{Cu}_3\text{P} \rangle$	-30.82 ± 4.0	264	28.5	—
$\langle \text{CuP}_2 \rangle$	-21.52 ± 2.5	801	19.5	—
$\langle \text{Cu}_3\text{FeS}_4 \rangle$	-90.9	—	86.6	—
$\langle \text{CuFeS}_2 \rangle$	-45.5	—	29.87	—
$\langle \text{CuCO}_3 \rangle$	-142.5 ± 2.2	886	21.0	918
$\langle \text{CuAlO}_2 \rangle^*$	-2.85 ± 0.5	810	16.0 ± 0.3	810
$\langle \text{CuAl}_2\text{O}_4 \rangle^*$	$+4.4 \pm 0.5$	810	26.6 ± 0.4	810
$\langle \text{CuGaO}_2 \rangle^*$	-1.7 ± 0.5	811	19.9 ± 0.3	811
$\langle \text{CuGa}_2\text{O}_4 \rangle^*$	$+4.1 \pm 0.5$	811	35.0 ± 0.4	811
$\langle \text{CuFeO}_2 \rangle$	-122.5	—	21.24	—
$\langle \text{CuFe}_2\text{O}_4 \rangle$	-231.0	—	35.08	—
$\langle \text{Cu}_2\text{Sb} \rangle$	-2.74 ± 0.4	99	30.23 ± 0.4	99
$\langle \text{CuCr}_2\text{O}_4 \rangle$	$+0.75 \pm 0.9^*$	857	31.0 ± 2.2	—
$\langle \text{CuMg}_2 \rangle$	-6.95 ± 0.3	840	22.05 ± 0.3	840
$\langle \text{Cu}_2\text{Mg} \rangle$	-8.4 ± 0.4	840	23.4 ± 0.4	840
$\langle \text{Dy} \rangle$	0	—	17.87 ± 0.1	368
$\langle \text{DyCl}_3 \rangle$	-239.0 ± 2.6	918	35.1 ± 2.4	—
$\langle \text{Dy}_2\text{O}_3 \rangle$	-445.3 ± 3.0	808	35.8 ± 0.1	536
$\langle \text{Er} \rangle$	0	—	17.5 ± 0.15	412
$\langle \text{ErCl}_3 \rangle$	-229.1 ± 1.0	332	35.1 ± 1.0	332
$\langle \text{Er}_2\text{O}_3 \rangle$	-453.6 ± 1.0	371	36.6 ± 0.1	536
$\langle \text{Eu} \rangle$	0	—	19.3	99
$\langle \text{EuCl}_3 \rangle$	-220.4 ± 1.8	779	30.0 ± 3.5	779
$\langle \text{Eu}_2\text{O}_3 \rangle$	-412.4 ± 2.5	—	35.0	—
$\langle \text{EuS} \rangle$	-106.7 ± 1.8	802	23.6 ± 1.3	802
$\langle \text{F}_2 \rangle$	0	—	48.44 ± 0.1	173, 125
$\langle \text{F} \rangle$	$+18.86 \pm 0.6$	817	37.92 ± 0.02	817
$\langle \text{Fe} \rangle$	0	—	6.52 ± 0.03	99
$\langle \text{Fe} \rangle$	$+99.3 \pm 0.3$	99	43.11	99
$\langle \text{FeF}_2 \rangle$	-170.0 ± 2.5	—	20.8 ± 0.1	415
$\langle \text{FeF}_3 \rangle$	-249.0	817	23.5	817

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	432	—	CaC_2	—
—	—	—	—	—
—	1019	—	K_2SO_4	—
—	—	—	—	—
—	1083	2560	Ag	—
—	—	—	—	—
—	770	—	CaF_2	—
408	451	1212	ZnS	—
—	—	—	—	—
380, 470	489	1355	ZnS	—
—	—	—	—	—
372, 410	600	1320	ZnS	$\dagger \text{CuI}_{1.0-1.0045}$
—	1236	—	Table Aa	—
—	—	—	monoclinic	—
—	—	—	ZnS	$\dagger \text{CuS}_{0.5-0.50025}$
103, 444	1129	—	hexagonal	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
122	1117	—	$\sim \text{CaF}_2$	$\S \text{CuSe}_{0.333-0.355}$
153	[382]	—	CuS	—
160, 258, 317, 360, 568	855	—	hexagonal	—
—	—	—	ReO_3	—
—	1030	—	hexagonal	—
—	—	—	monoclinic	—
212	—	—	—	—
—	557	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
818	1197	—	—	—
202, 522	1085	—	—	—
—	[586]	—	—	—
—	—	—	tetragonal.	$\dagger$ from oxides
—	—	—	f.c. o'rhomb.	—
—	566	—	Table Aa	—
—	819	—	—	—
1384	1409	2560	Mg	—
—	651	—	—	—
2200	2380	—	Sc_2O_3	—
1470	1522	2860	Mg	—
—	774	—	—	—
2270	2400	—	Sc_2O_3	—
—	—	—	—	—
—	—	—	—	—
—	817	1600	b.c.c.	—
—	623	—	monoclinic	—
622, 2240	2320	—	—	—
—	—	—	—	—
-227.6	-219.6	-188	—	—
—	—	—	—	—
911, 1392	1536	2860	Na	—
—	—	—	—	—
—	1100	1837	TiO_2	—
—	Sb	930	rhombohed.	—

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{FeCl}_2 \rangle$	-81.8 ± 0.2	158, 551	28.2 ± 0.5	907
$\langle \text{FeCl}_3 \rangle$	-95.5 ± 0.2	907	34.0 ± 0.4	817
$\langle \text{FeBr}_2 \rangle$	-59.7 ± 0.5	918	33.4 ± 0.7	907
$\langle \text{FeBr}_3 \rangle$	-63.9 ± 2.0	158	41.5 ± 3.0	—
$\langle \text{FeI}_2 \rangle$	-27.8 ± 2.0	907	40.6 ± 0.8	907
$\langle \text{FeOCl} \rangle$	-97.65 ± 2.0	406	18.3 ± 1.5	406
$\langle \text{Fe}_{0.95}\text{O} \rangle^*$	-63.2 ± 0.3	307	14.05 ± 0.2	307
$\langle \text{Fe}_2\text{O}_4 \rangle$	-266.9 ± 1.0	307	36.2 ± 0.6	307
$\langle \text{Fe}_2\text{O}_3 \rangle$	-196.3 ± 0.8	307	20.9 ± 0.1	503
$\langle \text{FeOOH} \rangle$	-133.6	918	14.2 ± 1.2	—
$\langle \text{FeS} \rangle^\dagger$	-24.0 ± 0.6	907	14.41 ± 0.05	907
$\langle \text{FeS}_2 \rangle$	-41.0 ± 2.0	854	12.65 ± 0.1	503
$\langle \text{FeSO}_4 \rangle$	-222.0 ± 3.0	817	28.91	817
$\langle \text{Fe}_2(\text{SO}_4)_3 \rangle$	(-617.35 ± 2.0)	—	73.5 ± 0.5	796
$\langle \text{FeSe}_{0.96} \rangle$	-16.0 ± 1.5	854	16.54 ± 1.0	854
$\langle \text{FeSe}_{1.14} \rangle$	-15.8 ± 0.8	854	20.95 ± 1.0	854
$\langle \text{Fe}_3\text{Se}_4 \rangle^\S$	-50.7 ± 0.7	854	66.9 ± 3.0	854
$\langle \text{FeTe}_{0.9} \rangle$	-5.5 ± 0.9	854	19.15 ± 0.1	854
$\langle \text{FeTe}_2 \rangle$	-17.2 ± 1.1	854	23.95 ± 0.15	854
$\langle \text{Fe}_4\text{N} \rangle$	-2.65 ± 1.0	907	37.2 ± 1.8	—
$\langle \text{Fe}_3\text{P} \rangle$	-39.2 ± 2.0	307	24.3 ± 3.0	—
$\langle \text{Fe}_2\text{P} \rangle$	-38.3 ± 2.0	307	17.3 ± 2.0	—
$\langle \text{FeP} \rangle$	-33.0 ± 3.0	307	—	—
$\langle \text{FeP}_2 \rangle$	-52.8 ± 4.0	307	—	—
$\langle \text{Fe}_2\text{C} \rangle$	$+6.0 \pm 1.0$	99	25.0 ± 1.0	99
$\langle \text{FeCO}_3 \rangle$	-177.0 ± 1.8	918	22.2 ± 0.4	125
$\langle \text{Fe}(\text{CO})_5 \rangle$	-173.0 ± 2.0	907	106.4 ± 0.8	907
$\langle \text{FeSi} \rangle$	-18.38 ± 1.2	769	10.0 ± 0.5	769
$\langle \text{Fe}_2\text{SiO}_4 \rangle$	$-8.2 \pm 1.5^*$	840	34.7 ± 0.5	125
$\langle \text{Fe}_2\text{B} \rangle$	-17.0 ± 4.0	795	13.54	—
$\langle \text{FeB} \rangle$	-17.0 ± 4.0	795	6.62	—
$\langle \text{FeTi} \rangle$	-9.7 ± 0.4	308	12.6 ± 2.1	—
$\langle \text{FeTiO}_3 \rangle$	$-7.1 \pm 1.2^*$	—	25.3 ± 0.3	125
$\langle \text{FeAl}_2\text{O}_4 \rangle$	$-6.65 \pm 0.3^*$	768	25.5 ± 0.2	768
$\langle \text{Fe}_2\text{ZnO}_4 \rangle$	$-1.2 \pm 1.0^*$	840	32.2 ± 0.2	377
$\langle \text{FeMoO}_4 \rangle$	$-13.0 \pm 4.5^*$	840	30.9 ± 0.5	840
$\langle \text{FeWO}_4 \rangle$	$-18.0 \pm 3.0^*$	840	31.5 ± 0.5	840
$\langle \text{Fe}_2\text{NiO}_4 \rangle$	$-5.4 \pm 2.0^*$	840	30.1 ± 0.2	377
$\langle \text{Fe}_2\text{CoO}_4 \rangle$	$-6.6 \pm 0.6^*$	840	34.1 ± 2.0	840
$\langle \text{FeCo}_2\text{O}_4 \rangle$	—	—	30.0 ± 0.2	377
$\langle \text{FeCr}_2\text{O}_4 \rangle$	$-12.45 \pm 0.5^*$	812	35.1 ± 0.4	812
$\langle \text{FeV}_2\text{O}_4 \rangle$	$-5.8 \pm 0.5^*$	812	37.5 ± 0.7	812
$\langle \text{Fe}_3\text{Mo}_2 \rangle$	-1.0 ± 2.0	902	35.0 ± 2.0	902
$\langle \text{Ga} \rangle$	0	—	9.8 ± 0.1	1, 125
$\langle \text{Ga} \rangle$	68.3 ± 2.5	457	40.4 ± 0.2	99
$\langle \text{GaCl}_3 \rangle$	-125.4 ± 1.1	907	32.3 ± 3.3	—
$\langle \text{GaBr}_3 \rangle$	-92.4 ± 1.0	27	43.0 ± 2.8	—
$\langle \text{GaI}_3 \rangle$	-57.2 ± 2.9	907	48.7 ± 4.0	—
$\langle \text{Ga}_2\text{O}_3 \rangle$	-258.8 ± 1.2	310, 484, 22	20.23 ± 0.1	1
$\langle \text{Ga}_2\text{S} \rangle$	$+5.0 \pm 8.0$	854	69.3 ± 2.0	854
$\langle \text{GaS} \rangle$	-50.0 ± 5.0	854	13.8 ± 1.5	854
$\langle \text{Ga}_2\text{S}_3 \rangle$	-122.8 ± 3.0	—	33.4 ± 3.5	—
$\langle \text{GaSe} \rangle$	-38.5 ± 2.5	854	16.8 ± 0.5	854
$\langle \text{Ga}_2\text{Se}_3 \rangle$	-97.0 ± 4.0	—	45.9 ± 3.7	—
$\langle \text{Ga}_2(\text{SeO}_4)_3 \rangle$	-472.8 ± 3.6	906	(72.5)	—
$\langle \text{GaTe} \rangle$	-29.5 ± 2.3	854	20.4 ± 0.15	854
$\langle \text{Ga}_2\text{Te}_3 \rangle$	-65.0 ± 2.6	80	53.2 ± 2.5	421

standard entropies and structures (contd.)

tr. pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	677	1012	CdCl_2	
—	308	315	AsI_3	
—	688	968	—	
377	691	968	AsI_3	
—	—	—	—	
—	—	—	—	
—	1378	—	NaCl	$^*\text{FeO}_{1.055-1.19} (1400^\circ\text{C})$
—	1597	—	spinel	
—	1594	—	—	
—	—	—	—	
138, 325	1195	—	NiAs	$^\dagger\text{FeS}_{1.00-1.14}$
—	743	—	Table Aa	
—	—	—	—	
—	—	—	—	
457	—	—	tetrag., PbO	
—	—	—	NiAs (hex.)	
—	—	—	monoclinic	$^\S\text{FeSe}_{1.18-1.35}$
—	927	6	—	
—	660	—	—	
—	—	—	$\text{Ag}^\parallel$	$^\parallel\text{N}$ interstitial
—	1166	—	tetragonal	
—	1365	—	Table Aa	
—	—	—	CoP	
—	—	—	marcasite	
212	1225	—	orthorhomb.	
—	—	—	MgCO_3	
—	—	—	—	
—	1410	—	cubic	
—	1220	—	Mg_2SiO_4	$^*\text{from oxides}$
—	1389	—	—	
—	1650	—	—	
—	1317	—	CsCl	
—	1200	—	Cr_2O_3	$^*\text{from oxides}$
—	1780	—	spinel	$^*\text{from oxides}$
—	1720	—	—	$^*\text{from oxides}$
—	—	—	—	$^*\text{from oxides}$
—	—	—	—	$^*\text{from oxides}$
—	580	1650	spinel	$^*\text{from oxides}$
—	—	—	spinel	$^*\text{from oxides}$
—	—	—	spinel	$^*\text{from oxides}$
—	—	—	spinel	$^*\text{from oxides}$
—	—	—	—	$^*\text{from oxides}$
—	{4370}	—	—	$^*\text{from oxides}$
—	30	2420	Table Aa	
—	—	—	—	
—	78	302	—	
—	122	292	—	
—	213	—	—	
—	1795	—	Cr_2O_3	
—	—	—	—	
—	960	—	ZnS	
—	—	—	ZnS	
—	960	—	ZnS	
—	1020	—	$\sim\text{ZnS}$	
—	—	—	—	
—	835	—	ZnS	
670	792	—	$\sim\text{ZnS}$	

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
<GaN>	-26.2 ± 2.2	854	7.1 ± 1.8	—
<GaAs>	-19.5 ± 0.6	840	15.35 ± 0.1	854
<GaP>	-29.2 ± 2.0	908	12.5 ± 0.2	850
<GaSb>	-10.0 ± 0.3	611, 421	18.48 ± 0.3	591, 421
<Gd>	0	—	16.24 ± 0.2	99
<GdOCl>	-235.1 ± 0.9	793	22.8 ± 2.2	—
<GdCl ₃ >	-240.1 ± 1.0	332	34.9 ± 0.6	332
<GdI ₃ >	-142.0	318	51.8	—
<Gd ₂ O ₃ >	-434.0 ± 4.0	372	36.0 ± 0.1	536
<Ge>	0	—	7.43 ± 0.05	482, 591
(Ge)	+89.5 ± 0.5	99	40.10	99
(GeH ₄)	+21.7 ± 0.5	907	51.9 ± 0.2	907
<GeF ₂ >	-157.35 ± 1.0	749	20.1	—
(GeF ₄)	-284.87 ± 0.3	797	72.35 ± 0.2	907
{GeCl ₄ }	(-130.0)	198	—	—
(GeCl ₄)	-120.6	907	83 ± 0.3	907
(GeBr ₄)	-71.4 ± 2.2	907	94.7 ± 0.4	907
(GeI ₄)	-9.0 ± 2.5	907	102.5 ± 0.5	907
(GeO)	-7.33	907	53.5 ± 0.05	907
<GeO ₂ >	-138.6 ± 0.3	754	9.5 ± 0.05	754
<GeS>	-18.2 ± 1.1	854	15.77 ± 0.24	854
(GeS)	+23.2 ± 2.0	854	56.26 ± 0.5	854
<GeS ₂ >	-37.5 ± 3.0	854	20.9 ± 0.5	854
<GeSe>	-16.5 ± 2.5	854	18.9 ± 0.3	854
<GeSe ₂ >	-27.0 ± 5.0	854	26.9 ± 1.0	854
<GeTe>	-7.8 ± 3.0	907	21.3 ± 0.3	854
<Ge ₃ N ₄ >	(-15.6)	264	(37.0)	—
<GeP>	-6.5 ± 2.5	232	14.6 ± 2.0	232
(H ₂)	0	—	31.21 ± 0.02	125
(H)	-52.1 ± 0.5	198	27.4 ± 0.01	125
(HF)	-65.14 ± 0.35	817	41.51	918
(HCl)	-22.063	key value	44.643	key value
(HBr)	-8.695	key value	47.463	key value
(HI)	+6.3 ± 0.19	key value	49.35 ± 0.01	key value
(H ₂ O)	-68.315	key value	16.718	key value
(H ₂ O)	-57.795	key value	45.106	key value
{H ₂ O ₂ }	-44.87 ± 0.05	907	26.17 ± 0.12	907
(H ₂ O ₂)	-32.59 ± 0.04	907	55.66 ± 0.12	907
(H ₂ S)	-4.9 ± 0.1	198	49.15 ± 0.1	198
{H ₂ S ₂ }	-4.3 ± 0.2	854	48.0 ± 3.0	854
(H ₂ S ₂)	+3.76 ± 0.2	854	63.66	854
(H ₂ Se)	+7.0 ± 0.3	854	52.3 ± 0.03	854
(H ₂ Te)	+23.8 ± 0.2	854	54.7 ± 0.5	854
(HCN)	-32.2	907	48.20 ± 0.03	907
<Hf>	0	—	10.41 ± 0.05	99
(Hf)	+148.0 ± 1.0	99	44.65	99
<HfF ₄ >	-461.4 ± 2.5	500	32.5	—
<HfCl ₄ >	-236.7 ± 1.0	505	45.6 ± 0.6	243
<HfO ₂ >	-266.0 ± 3.0	97, 22	14.2 ± 0.1	243
<HfN>	-88.2 ± 0.6	97	12.1 ± 1.5	—
<HfC>	-52.3 ± 0.7	710	9.45 ± 0.1	99
<HfB ₂ >	-80.3 ± 2.0	918	10.2 ± 0.1	918

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	1500	—	wurtzite	—
—	1238	—	—	—
—	1520	—	—	—
—	712	—	ZnS	—
1260	1312	3270	Mg	—
—	—	—	—	—
—	609	—	—	—
740	930	—	—	—
—	2340	—	Sc ₂ O ₃	—
—	937	2834	diamond	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	-50	-36	—	—
—	—	84	—	—
—	—	—	—	—
—	26	—	—	—
—	146	—	—	—
1035	1116	—	tetragonal	—
—	665	—	orthorhomb.	—
—	—	—	—	—
—	860	—	—	—
—	675	—	—	—
—	740	—	—	—
—	724	—	—	—
—	—	—	Be ₂ SiO ₄	—
—	—	—	—	—
—	-259	-253	—	—
—	—	—	—	—
—	-83	19.5	—	—
—	-114	-8.5	—	—
—	-87	-67	—	—
—	-51	-35	—	—
—	0	100	—	—
—	—	—	—	—
—	-0.4	152	—	—
—	—	—	—	—
—	-86	-60	—	—
—	-90	71	—	—
—	—	—	—	—
—	-66	-41	—	—
—	—	—	—	—
—	—	—	—	—
1740	2230	4600	Mg	—
—	—	—	—	—
—	—	—	—	—
—	—	316	—	—
1700	2810	—	monoclinic	—
—	3330	—	—	—
—	3830	—	—	—
—	3370	—	—	—

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
{Hg}	0	—	18.14 ± 0.03	907
(Hg)	+14.676	99	41.8	99
<HgF>	-58.7 ± 3.5	441	20.9 ± 2.0	—
<HgF ₂ >	-95.0 ± 10.0	22	28.0 ± 5.0	22
<HgCl>	-31.5 ± 0.3	22, 198	23.0 ± 0.5	125
<HgCl ₂ >	-54.55 ± 0.3	907	33.47	907
<HgBr>	-24.7 ± 0.3	198	26.0 ± 0.5	125
<HgBr ₂ >	-40.6 ± 0.3	907	43.0	907
<HgI>	14.4 ± 0.2	198	28.1	907
<HgI ₂ >†	25.2 ± 0.4	198	43.0 ± 1.8	918
<HgO> _{red}	21.7 ± 0.2	198	16.8 ± 0.1	125
<HgS> _{red}	12.75 ± 1.0	854	19.7 ± 0.5	854
<Hg ₂ SO ₄ >	-177.6 ± 3.0	918	48.0 ± 0.1	125, 588
<HgSO ₄ >	-168.3 ± 3.0	918	33.5 ± 2.0	—
<HgSe>	-10.35 ± 3.3	859	24.1 ± 1.0	854
<HgSeO ₃ >	-87.3 ± 1.2	907	38.8 ± 8.0	907
<HgTe>	-7.6 ± 1.0	854	27.0 ± 0.5	854
<Ho>	0	—	17.93	99
<HoF ₃ >	-408.0	918	26.5 ± 2.8	—
<HoCl ₃ >	-240.3 ± 2.5	918	35.1 ± 2.3	—
<Ho ₂ O ₃ >	449.6 ± 2.0	371	37.8 ± 0.1	536
<I ₂ >	0	—	27.76 ± 0.02	key value
(I ₂)	14.92 ± 0.02	key value	62.277	key value
(I)	25.52 ± 0.02	key value	43.182	key value
<In>	0	—	13.82 ± 0.2	99
(In)	58.0 ± 0.3	99	41.50	99
<InCl>	-44.5 ± 2.0	907	22.7 ± 1.5	907
<InCl ₂ >	-86.7 ± 4.0	907	29.2 ± 4.0	907
<InCl ₃ >	-128.4 ± 2.0	907	33.7 ± 2.0	—
<InBr>	-41.9 ± 2.0	907	27.3 ± 2.2	—
(InBr)	-12.3 ± 2.5	(907)	62.03 ± 0.03	907
<InBr ₃ >	-98.2 ± 2.0	907	42.7 ± 3.3	—
<InI>	-27.8 ± 2.0	414	31.1 ± 2.0	—
<InI ₃ >	-56.1 ± 3.0	907	48.6 ± 2.5	—
<In ₂ O ₃ >	-221.3 ± 0.4	907	25.8 ± 0.8	907
<InS>	-32.0 ± 3.0	854	16.5 ± 1.5	854
(InS)	+55.7 ± 3.0	854	60.15	854
<In ₂ S ₆ >	-185.0 ± 15.0	854	89.5 ± 10.0	854
<In ₂ S ₃ >	-85.0 ± 5.0	854	39.1 ± 0.6	854
<In ₂ (SO ₄) ₃ >	-651.4 ± 0.9	907	72.2 ± 0.5	907
<InSe>	-28.2 ± 3.0	854	19.5 ± 1.0	854
<In ₂ Se ₃ >	-78.0 ± 4.0	854	48.1 ± 4.0	854
<In ₂ Te>	-19.0 ± 0.4	725	37.5 ± 2.5	—
<InTe>	-17.2 ± 0.5	725	25.26 ± 0.05	854
<In ₂ Te ₃ >	-45.8 ± 0.7	725	57.0 ± 2.0	—
<In ₂ Te ₅ >	-45.8 ± 0.6	725	—	—
<InP>	-18.0 ± 2.0	908	14.28 ± 0.1	—
<InN>	-33.0 ± 2.5	915	10.4 ± 1.5	—
<InAs>	-13.8 ± 0.5	840	17.85 ± 0.3	840
<InSb>	-7.44	—	20.95	—
<Ir>	0	—	8.49 ± 0.05	99
(Ir)	+160.0 ± 1.5	99	46.25	99
(IrF ₆)	-130.0 ± 20.0	907	85.5 ± 0.4	907
<IrCl ₃ >	-60.8 ± 4.0	757	27.45 ± 4.0	757

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	-38.86	357	Table Aa	
—	—	—	—	
—	570	—	—	
—	645	(650)	—	
—	543	—	tetragonal	
155	280	302	Orthorhom.	
—	407	—	HgCl	
—	238	—	—	
—	—	—	HgCl	
96	256	353	Table Aa	† red
—	—	—	—	
345	825	—	hexagonal	
—	—	—	—	
—	—	—	—	
—	770	—	ZnS	
360	—	—	—	
670	—	—	ZnS	
1428	1470	2700	Mg	
—	1070	1143	—	
—	720	—	—	
2270	2390	—	Sc ₂ O ₃	
—	114	183	Table Aa	
—	—	—	—	
—	—	—	—	
—	157	2073	—	
—	—	—	—	
120	225	—	—	
190	236	(523)	—	
—	583	—	—	
—	285	—	InI	
—	—	—	—	
—	420	—	—	
—	365	(986)	orthorhomb.	
—	207	447	—	
1250	1910	—	Sc ₂ O ₃	
—	[680]	—	—	
—	—	—	—	
—	—	—	—	
387, 827	1090	—	—	
670	—	—	—	
—	660	—	—	
197, 650, 750	890	—	—	
—	—	—	—	
—	695	—	—	
610	670	—	—	
—	—	—	—	
637	1055	—	—	
—	[1200]	—	wurtzite	
—	942	—	—	
—	525	—	ZnS	
—	2443	4430	Ag	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{IrBr}_3 \rangle$	(-33.1)	831	(42.0)	—
$\langle \text{IrI} \rangle$	-11.0 $\pm$ 3.0	22	26.0 $\pm$ 5.0	22
$\langle \text{IrI}_2 \rangle$	-20.0 $\pm$ 3.0	22	38.0 $\pm$ 5.0	22
$\langle \text{IrO}_2 \rangle$	-57.7 $\pm$ 3.0	757	13.5 $\pm$ 1.5	757
$\langle \text{IrO}_3 \rangle$	+3.2 $\pm$ 4.0	—	69.4 $\pm$ 2.0	—
$\langle \text{Ir}_2\text{S}_3 \rangle$	-58.4 $\pm$ 1.8	907	23.2	907
$\langle \text{IrS}_2 \rangle$	-34.6 $\pm$ 1.5	907	14.7	907
$\langle \text{K} \rangle$	0	—	15.46 $\pm$ 0.05	key value
$\langle \text{K} \rangle$	+21.3 $\pm$ 0.2	817	38.30	key value
$\langle \text{K}_2 \rangle$	+30.37 $\pm$ 0.5	817	59.67	817
$\langle \text{KH} \rangle$	-13.8 $\pm$ 1.2	702	12.3 $\pm$ 0.4	702
$\langle \text{KF} \rangle$	-135.9 $\pm$ 0.1	817	15.9 $\pm$ 0.1	269
$\langle \text{KCl} \rangle$	-104.37 $\pm$ 0.2	817	19.73 $\pm$ 0.1	817
$\langle \text{KBr} \rangle$	-94.12 $\pm$ 0.4	817	22.93 $\pm$ 0.1	817
$\langle \text{KI} \rangle$	-78.37 $\pm$ 0.3	817	25.43 $\pm$ 0.1	817
$\langle \text{K}_2\text{O} \rangle$	-86.8 $\pm$ 0.8	817	22.5 $\pm$ 1.5	—
$\langle \text{KO}_2 \rangle$	-68.0 $\pm$ 0.8	817	29.3 $\pm$ 1.2	817
$\langle \text{KOH} \rangle$	-101.5 $\pm$ 0.4	817	18.85 $\pm$ 0.2	817
$\langle \text{K}_2\text{S} \rangle$	-102.4 $\pm$ 3.5	198	—	—
$\langle \text{K}_2\text{SO}_3 \rangle$	-272.0 $\pm$ 5.0	879	38.4 $\pm$ 4.0	879
$\langle \text{K}_2\text{SO}_4 \rangle$	-342.6 $\pm$ 1.0	198	42.0 $\pm$ 0.5	125
$\langle \text{KAl}(\text{SO}_4)_2 \rangle$	-589.2 $\pm$ 4.0	198	48.9 $\pm$ 0.3	125
$\langle \text{K}_2\text{Se} \rangle$	-89.0 $\pm$ 6.0	—	—	—
$\langle \text{K}_2\text{HPO}_4 \rangle$	-424.0	830	42.0	830
$\langle \text{KH}_2\text{PO}_4 \rangle$	-373.4	830	32.15	830
$\langle \text{K}_3\text{Sb} \rangle$	-45.0 $\pm$ 8.0	—	—	—
$\langle \text{K}_3\text{Bi} \rangle$	-54.1 $\pm$ 4.0	99	47.3 $\pm$ 4.0	—
$\langle \text{K}_2\text{CO}_3 \rangle$	-274.9 $\pm$ 1.5	817	37.17	817
$\langle \text{K}_2\text{Si}_4\text{O}_9 \rangle$	-73.9 $\pm$ 3.0*	840	63.5 $\pm$ 3.0	840
$\langle \text{K}_2\text{Si}_2\text{O}_5 \rangle$	-71.5 $\pm$ 3.0*	840	43.5 $\pm$ 2.0	840
$\langle \text{K}_2\text{SiO}_3 \rangle$	-65.5 $\pm$ 3.0*	840	34.9 $\pm$ 0.5	840
$\langle \text{K}_2\text{CrO}_4 \rangle$	-331.2 $\pm$ 1.2	803, 896	47.8 $\pm$ 0.8	124, 125
$\langle \text{KTI} \rangle$	-13.5 $\pm$ 2.5	—	—	—
$\langle \text{KHg} \rangle$	-13.4 $\pm$ 1.0	264	—	—
$\langle \text{KHg}_2 \rangle$	-18.5 $\pm$ 1.5	264	—	—
$\langle \text{KHg}_3 \rangle$	-20.0 $\pm$ 2.0	264	—	—
$\langle \text{KHg}_4 \rangle$	-21.5 $\pm$ 2.0	264	—	—
$\langle \text{KHg}_8 \rangle$	-25.0 $\pm$ 2.5	264	—	—
$\langle \text{La} \rangle$	0	—	13.6 $\pm$ 0.5	182, 125
$\langle \text{La} \rangle$	+103.0	99	43.56	99
$\langle \text{LaH}_2 \rangle$	-45.2	918	12.35 $\pm$ 0.07	759
$\langle \text{LaF}_3 \rangle$	-426.0	784	27.1	—
$\langle \text{LaCl}_3 \rangle$	-255.9 $\pm$ 0.8	332	(34.5)	332
$\langle \text{LaBr}_3 \rangle$	-208.0	784	43.5	—
$\langle \text{LaI}_3 \rangle$	-157.0 $\pm$ 2.5	88	51.3	—
$\langle \text{La}_2\text{O}_3 \rangle$	-428.6 $\pm$ 0.5	682	30.6 $\pm$ 0.1	494
$\langle \text{LaOCl} \rangle$	-243.8 $\pm$ 2.0	793	19.8 $\pm$ 2.5	—
$\langle \text{La}_2\text{S}_3 \rangle$	-292.0 $\pm$ 16.0	854	39.43 $\pm$ 0.1	—
$\langle \text{La}_2\text{Se}_3 \rangle$	-223.0 $\pm$ 5.0	854	48.33 $\pm$ 0.2	854
$\langle \text{La}_2\text{Te}_3 \rangle$	-187.5 $\pm$ 6.1	854	53.36 $\pm$ 0.1	854
$\langle \text{LaN} \rangle$	-71.5 $\pm$ 4.0	264	10.6 $\pm$ 1.1	—
$\langle \text{LaAl}_2 \rangle$	-36.0 $\pm$ 9.0	264	23.60 $\pm$ 0.05	777
$\langle \text{LaMg} \rangle$	-4.3 $\pm$ 1.2	866	22.35 $\pm$ 1.5	866
$\langle \text{Li} \rangle$	0	—	6.95 $\pm$ 0.1	568
$\langle \text{Li} \rangle$	+38.5 $\pm$ 2.0	293	33.15 $\pm$ 0.1	293

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	63.2	770	Na	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	858	1517	NaCl	—
—	772	1437	NaCl	—
—	734	1398	NaCl	—
—	681	1345	NaCl	—
—	—	—	—	—
—	509	—	tetragonal	—
243	406	1327	—	—
146	835	—	CaF ₂	—
—	700	—	—	—
586	1069	—	orthorhomb.	—
—	—	—	—	—
—	—	—	CaF ₂	—
—	—	—	—	—
—	—	—	—	—
—	812	—	Na ₃ Bi	—
—	675	—	Na ₃ Bi	—
—	901	—	—	—
592	770	—	—	—
—	1045	—	—	—
—	976	—	orthorhomb.	—
666	971	—	—	—
—	335	—	—	—
—	180	—	triclinic	—
—	275	—	orthorhomb.	—
—	204	—	—	—
—	173	—	—	—
—	(70)	—	—	—
280, 861	920	3460	Mg	—
—	—	—	—	—
—	1493	—	—	—
—	855	1812	UCl ₃	—
—	788	—	—	—
—	761	1472	PuBr ₃	—
2040, 2210	2320	—	Table Aa	—
—	—	—	—	—
—	2130	—	Ce ₂ S ₃	—
—	1630	—	—	—
—	1490	—	—	—
—	2450	—	—	—
—	1924	—	NaCl	—
—	—	—	MgCu ₂	—
—	—	—	—	—
—	181	1324	Na	—

*from oxides
*from oxides
*from oxides

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
(Li ₂)	+50.5 ± 3.0	293	47.05 ± 0.2	293
<LiH>	-21.5 ± 0.2	386, 138	4.8 ± 0.1	702
<LiF>	-147.45 ± 1.5	817	8.5 ± 0.05	36
<LiCl>	-96.9 ± 2.0	198, 225	14.17 ± 0.1	620
<LiBr>	-83.4 ± 2.0	198	17.0 ± 2.0	22
<LiI>	-64.8 ± 2.0	198	20.5 ± 2.0	—
<Li ₂ O>	-142.6 ± 1.0	198, 104, 552	9.06 ± 0.05	104
<Li ₂ O ₂ >	-151.8 ± 2.0	138	13.5	—
<LiOH>	-116.6 ± 0.3	198, 104	10.2 ± 0.1	11
<Li ₂ S>	-106.7 ± 2.0	854	14.5	—
<Li ₂ SO ₄ >	-342.8 ± 2.5	138	29.0 ± 6.0	155
<Li ₂ Se>	-96.0 ± 9.0	854	17.0 ± 3.0	854
<Li ₂ Te>	-85.0 ± 5.0	854	18.5 ± 3.0	854
<Li ₃ N>	-47.0 ± 0.5	264	—	—
<Li ₃ Sb>	-43.0 ± 3.0	264	—	—
<Li ₃ Bi>	-55.5 ± 4.0	264	—	—
<Li ₂ CO ₃ >	-290.8 ± 2.0	198	21.55	817
<Li ₂ SiO ₃ >	-33.4 ± 2.0*	840	19.2 ± 0.3	840
<Li ₂ TiO ₃ >	-30.9 ± 2.5*	721	21.9 ± 0.1	303
<LiAl>	-11.7 ± 2.5	—	11.2 ± 1.5	—
<LiAlO ₂ >	-12.9 ± 1.5*	359	12.7 ± 0.1	398
<LiTi>	-12.8 ± 1.0	264	—	—
<LiFeO ₂ >	-4.25 ± 0.5	353	18.0 ± 0.2	398
<Li ₂ BeF ₄ >	-544.25 ± 1.9	755	29.8 ± 2.0	817
<LiBeF ₃ >	-394.55 ± 2.0	755	21.3 ± 2.0	817
<Lu>	0	—	12.18 ± 0.2	99
<Lu ₂ O ₃ >	-449.8 ± 3.0	371	26.3 ± 0.2	—
<Mg>	0	—	7.81 ± 0.02	99
(Mg)	+35.0 ± 0.3	99	35.50	99
<MgH ₂ >	-18.0 ± 0.7	918	7.43 ± 1.0	918
<MgF ₂ >	-268.5 ± 1.5	918	13.68 ± 0.1	918
<MgCl ₂ >	-153.3 ± 0.2	918	21.42 ± 0.2	918
<MgBr ₂ >	-125.3 ± 1.2	918	28.0	918
<MgI ₂ >	-87.0 ± 1.2	918	31.0 ± 2.5	—
<MgO>	-143.7 ± 0.2	817	6.44 ± 0.1	817
<Mg(OH) ₂ >	8.85 ± 0.2*	772	15.1 ± 0.05	828
<MgS>	-84.0 ± 0.8	854	12.03 ± 0.2	854
<MgSO ₄ >	-307.1 ± 3.0	918	21.9 ± 0.2	828
<MgSe>	-65.2 ± 4.0	—	15.0 ± 2.0	—
<MgSeO ₃ >	-215.15	918	22.9 ± 3.2	—
<MgTe>	-50.0 ± 5.0	264	17.8 ± 1.4	—
<Mg ₃ N ₂ >	-110.3 ± 1.7	892	22.4 ± 1.8	892
<Mg ₃ P ₂ >	-111.0 ± 20.0	—	18.5 ± 6.0	—
<Mg ₃ (PO ₄) ₂ >	-903.6	918	45.22	918
<Mg(NO ₃) ₂ >	-189.0	918	39.2	918
<Mg ₃ Sb ₂ >	-71.7 ± 4.0	—	32.65 ± 3.5	—
<Mg ₃ Bi ₂ >	-30.3	—	45.85	—
<Mg ₂ C ₃ >	+19.0 ± 8.0	101	14.0 ± 2.5	—
<MgC ₂ >	+21.0 ± 5.0	794	14.0 ± 2.5	—
<MgCO ₃ >	-265.7 ± 3.5	860	15.74 ± 0.2	860
<Mg ₂ Si>	-18.9 ± 1.2	840	15.25 ± 1.7	840
<Mg ₂ SiO ₄ >	-15.0 ± 0.5*	840	22.75 ± 0.2	828
<MgSiO ₃ >	-8.7 ± 0.7*	840	16.2 ± 0.3	828
<Mg ₂ Ge>	-27.53 ± 0.4	840	17.43 ± 0.45	840
<Mg ₂ Sn>	-19.25 ± 1.3	840	24.25 ± 0.04	840
<Mg ₂ Pb>	-11.5 ± 0.7	—	28.5 ± 3.0	—

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	—	—	—	—
—	688	—	LiCl	—
—	848	1681	NaCl	—
—	610	1382	NaCl	—
—	550	1310	NaCl	—
—	469	1170	NaCl	—
—	>1700	—	CaF ₂	—
225	dec.	—	—	—
—	473	770	SnO	—
—	950	—	CaF ₂	—
575	859	—	—	—
—	1102	—	CaF ₂	—
—	—	—	—	—
—	dec.	—	hexagonal	—
—	(960)	—	Na ₃ Bi	—
—	1145	—	BiF ₃	—
—	726	—	—	—
—	1201	—	—	—
—	1077	—	—	—
—	720	—	NaTi	—
—	1430	—	—	—
—	508	—	CsCl	—
600	—	—	tetragonal	—
—	472	—	—	—
—	—	—	—	—
1600	1663	3395	—	—
—	—	—	Sc ₂ O ₃	—
—	649	1090	Table Aa	—
—	—	—	—	—
—	1263	2332	rutile	—
—	714	1418	CdCl ₂	—
—	711	—	CdI ₂	—
—	650	—	CdI ₂	—
—	2825	3260	NaCl	—
—	—	—	CdI ₂	—
—	—	—	NaCl	—
1010	1130	—	—	—
—	—	—	NaCl	—
—	—	—	—	—
—	—	—	wurtzite	—
550, 788	—	—	Sc ₂ O ₃	—
—	—	—	Sc ₂ O ₃	—
—	1348	—	—	—
—	—	—	—	—
—	925	1245	La ₂ O ₃	—
—	702	821	La ₂ O ₃	—
—	—	—	—	—
—	—	—	ThC ₂	—
—	diss.	—	rhombohed.	—
—	1077	—	CaF ₂	—
—	1890	—	orthorhomb.	—
—	1580	—	orthorhomb.	—
—	1115	—	—	—
—	775	—	CaF ₂	—
—	549	—	CaF ₂	—

*from oxides
*from oxides

*from oxides

*from <MgO> + {H₂O}

*from oxides
*from oxides

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{Mg}_2\text{TiO}_4 \rangle$	—	—	24.8 ± 0.2	243
$\langle \text{MgTiO}_3 \rangle$	$-5.5 \pm 0.5^*$	—	17.8 ± 0.2	828
$\langle \text{MgTi}_2\text{O}_5 \rangle$	—	—	30.4 ± 0.2	243
$\langle \text{MgB}_2 \rangle$	-22.0	817	8.6 ± 0.05	417
$\langle \text{MgB}_4 \rangle$	-25.1	817	12.4 ± 0.1	417
$\langle \text{MgAl}_2\text{O}_4 \rangle$	$-8.5 \pm 0.4^*$	840	19.25 ± 0.1	304
$\langle \text{MgCe} \rangle$	-3.85 ± 0.8	866	25.25 ± 0.9	866
$\langle \text{MgZn}_2 \rangle$	-7.8 ± 1.0	548	—	—
$\langle \text{MgZn} \rangle$	-4.0 ± 0.3	548	—	—
$\langle \text{MgNi}_2 \rangle$	-13.5 ± 0.5	548	21.2 ± 0.1	548
$\langle \text{Mg}_2\text{Ni} \rangle$	-12.4 ± 0.5	548	22.7 ± 1.5	—
$\langle \text{Mg}_2\text{Ca} \rangle$	-9.7 ± 0.5	548	19.5 ± 2.0	548
$\langle \text{MgFe}_2\text{O}_4 \rangle$	$-3.7 \pm 0.4^*$	840	29.6 ± 0.5	846
$\langle \text{MgMn}_2\text{O}_4 \rangle$	$-2.7 \pm 1.0^*$	840	—	—
$\langle \text{MgCr}_2\text{O}_4 \rangle$	$-10.0 \pm 1.0^*$	840	25.3 ± 0.3	840
$\langle \text{MgMoO}_4 \rangle$	$-12.9 \pm 1.0^*$	840	28.4 ± 0.2	840
$\langle \text{MgWO}_4 \rangle$	$-17.5 \pm 0.5^*$	840	24.1 ± 0.2	840
$\langle \text{MgV}_2\text{O}_7 \rangle$	$-19.55 \pm 0.6^*$	711	47.8 ± 0.9	637
$\langle \text{MgV}_2\text{O}_6 \rangle$	$-11.75 \pm 0.4^*$	711	38.4 ± 0.7	637
$\langle \text{Mn} \rangle$	0	—	7.65 ± 0.02	99
$\langle \text{Mn} \rangle$	$+67.7 \pm 1.0$	99	41.49	99
$\langle \text{MnF}_2 \rangle$	(-192)	—	22.05 ± 0.3	918
$\langle \text{MnF}_3 \rangle$	(-240)	—	25.0 ± 2.5	—
$\langle \text{MnCl}_2 \rangle$	-115.2 ± 0.5	551	28.25 ± 0.1	453
$\langle \text{MnBr}_2 \rangle$	-92.0 ± 2.0	918	33.0 ± 2.5	—
$\langle \text{MnI}_2 \rangle$	-58.0 ± 3.0	399, 772	36.0 ± 2.5	—
$\langle \text{MnO} \rangle^\dagger$	-92.0 ± 0.5	876	14.3 ± 0.2	244, 828
$\langle \text{Mn}_3\text{O}_4 \rangle^\ddagger$	-331.4 ± 1.0	876	36.8 ± 0.8	719
$\langle \text{Mn}_2\text{O}_3 \rangle^\S$	-228.7 ± 1.2	876	26.4 ± 0.5	303
$\langle \text{MnO}_2 \rangle^\P$	-124.3 ± 0.5	876	12.7 ± 0.1	828
$\langle \text{Mn}_2\text{O}_7 \rangle$	-174.1 ± 2.5	756	—	—
$\langle \text{MnS} \rangle_{\text{green}}$	-51.0 ± 0.5	854	19.2 ± 0.2	854
$\langle \text{MnS}_2 \rangle$	-53.5 ± 2.0	854	23.88 ± 0.1	854
$\langle \text{MnSO}_4 \rangle$	-254.6 ± 1.0	918	26.8 ± 0.3	125
$\langle \text{MnSe} \rangle$	-37.0 ± 2.5	854	21.7 ± 0.5	125
$\langle \text{MnTe} \rangle$	-26.6 ± 2.0	714	22.4 ± 0.5	125
$\langle \text{MnTe}_2 \rangle$	-30.0 ± 9.0	854	34.66 ± 0.1	854
$\langle \text{Mn}_{2.5}\text{N} \rangle^\dagger$	-24.1 ± 0.8	564	—	—
$\langle \text{Mn}_4\text{N} \rangle^\ddagger$	-30.5 ± 0.8	564, 307	—	—
$\langle \text{MnP} \rangle$	-23.0 ± 4.0	327	12.5 ± 2.2	—
$\langle \text{MnP}_3 \rangle$	-41.6 ± 7.5	—	23.1 ± 4.5	—
$\langle \text{MnAs} \rangle$	-13.7 ± 4.0	327	—	—
$\langle \text{Mn}_3\text{Sb} \rangle$	-7.8 ± 0.8	782	32.7 ± 1.5	782
$\langle \text{MnSb} \rangle$	-6.5 ± 0.6	782	22.1 ± 1.0	782
$\langle \text{MnBi} \rangle$	-4.7 ± 4.0	327	—	—
$\langle \text{Mn}_7\text{C}_3 \rangle$	-26.5 ± 2.5	794	57.1 ± 1.0	794
$\langle \text{MnCO}_3 \rangle$	-213.7 ± 1.2	772	20.5 ± 0.3	828
$\langle \text{Mn}_3\text{Si} \rangle$	-19.0 ± 3.0	840	24.8 ± 0.3	707
$\langle \text{Mn}_5\text{Si}_3 \rangle$	-48.0 ± 9.0	840	57.0 ± 0.8	840
$\langle \text{MnSi} \rangle$	-14.5 ± 3.0	840	11.1 ± 0.3	840
$\langle \text{Mn}_4\text{Si}_7 \rangle$	-73.7 ± 15.0	840	54.5 ± 1.5	840
$\langle \text{Mn}_2\text{SiO}_4 \rangle$	$-11.8 \pm 0.7^*$	301	24.0 ± 3.0	840
$\langle \text{MnSiO}_3 \rangle$	$-5.9 \pm 0.4^*$	131	24.5 ± 0.5	840
$\langle \text{MnFe}_2\text{O}_4 \rangle$	-4.8 ± 1.0	681	—	—
$\langle \text{MnSn}_2 \rangle$	-6.55 ± 0.7	845	31.28 ± 0.9	845
$\langle \text{MnB} \rangle$	-18.0	—	7.75	—
$\langle \text{MnB}_2 \rangle$	-22.5	—	8.25	—

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	1830	—	spinel	*from oxides
—	1840	—	Cr_2O_3	
—	—	—	Ti_3O_5	
—	—	—	—	*from oxides
—	—	—	spinel	
—	740	—	CsCl	
—	590	—	Table Aa	
—	—	—	—	*from oxides
—	1145	—	Table Aa	
—	[760]	—	hexagonal	
—	—	—	—	
—	(1700)	—	—	*from oxides
—	—	—	—	*from oxides
—	2350	—	spinel	*from oxides
—	—	—	—	*from oxides
—	1358	—	—	*from oxides
—	—	—	—	*from oxides
—	710	—	—	*from oxides
710, 1090, 1136	1244	—	Table Aa	
—	—	—	—	
—	856	—	rutile	
—	—	—	monoclinic	
—	650	1231	CdCl_2	
—	—	—	CdI_2	
—	638	—	CdI_2	
-56	1875	—	NaCl	$\dagger \text{MnO}_{1.0-1.12}$
1172	1565	—	tetragonal	$\ddagger \text{MnO}_{1.33-1.41}$
—	—	—	Sc_2O_3	$\S \text{MnO}_{1.15-1.6}$
250	—	—	orthorhomb.	$\P \text{MnO}_{1.96-2.0}$
—	—	—	—	
—	1530	—	various	
—	—	—	pyrites	
—	—	—	—	
-157	—	—	various	
—	1153	—	NiAs	
—	—	—	—	
—	—	—	—	$\dagger \text{MnN}_{0.4-0.5}$
—	—	—	—	$\ddagger \text{MnN}_{0.2-0.25}$
—	1147	—	CoP	
—	—	—	—	
—	935	—	NiAs	
—	948	—	—	
—	—	—	NiAs	
—	—	—	NiAs	
—	—	—	—	
—	—	—	MgCO_3	
—	—	—	Cubic DO_3	
—	[1070]	—	hexagonal D_{8h}	
—	1300	—	cubic B20	
—	1275	—	tetragonal	
—	—	—	Mg_2SiO_4	*from oxides
—	1345	—	triclinic	*from oxides
—	[1291]	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{MnAl}_2\text{O}_4 \rangle$	$-9.0 \pm 1.0^*$	—	24.8 ± 0.5	—
$\langle \text{MnCr}_2\text{O}_4 \rangle$	$-16.5 \pm 1.0^*$	—	32.0 ± 0.5	—
$\langle \text{MnMoO}_4 \rangle$	$-14.6 \pm 2.5^*$	840	32.5 ± 2.2	—
$\langle \text{Mo} \rangle$	0	—	6.85 ± 0.05	99
$\langle \text{Mo} \rangle$	157.3 ± 1.3	99	43.46	99
$\langle \text{MoF}_6 \rangle$	-372.4 ± 0.3	817	83.76 ± 0.5	817
$\langle \text{MoCl}_5 \rangle$	-126.0 ± 2.0	817	57.0 ± 3.0	817
$\langle \text{MoCl}_5 \rangle$	-107.0 ± 1.3	817	95.0 ± 3.0	817
$\langle \text{MoCl}_4 \rangle$	-114.0 ± 2.0	817	53.5 ± 3.0	817
$\langle \text{MoCl}_4 \rangle$	-92.0 ± 3.0	817	88.9	817
$\langle \text{MoO}_2 \rangle$	-140.5 ± 0.4	817	11.95 ± 0.3	817
$\langle \text{MoO}_3 \rangle$	-178.1 ± 0.2	817	18.59 ± 0.15	817
$\langle \text{MoO}_3 \rangle$	-86.2 ± 5.0	817	66.9 ± 4.0	817
$\langle \text{MoO}_2\text{Cl}_2 \rangle$	-151.3 ± 3.5	817	80.7 ± 1.3	817
$\langle \text{Mo}_2\text{S}_4 \rangle$	-98.0 ± 3.0	854	27.0 ± 3.0	854
$\langle \text{MoS}_2 \rangle$	-65.8 ± 1.4	854	14.96 ± 0.25	854
$\langle \text{Mo}_2\text{N} \rangle^\dagger$	-16.6 ± 0.5	307	(21.0)	307
$\langle \text{Mo}_2\text{C} \rangle^\ddagger$	-11.0 ± 0.7	722	15.7 ± 0.2	722
$\langle \text{Mo}(\text{CO})_6 \rangle$	-235.3 ± 2.5	358, 416	78.2 ± 0.3	341
$\langle \text{Mo}_3\text{Si} \rangle$	-27.8 ± 2.3	840	25.45 ± 0.2	—
$\langle \text{Mo}_3\text{Si}_3 \rangle$	-74.1 ± 5.8	840	49.7 ± 2.2	840
$\langle \text{MoSi}_2 \rangle$	-31.5 ± 2.3	840	15.55 ± 0.9	840
$\langle \text{N}_2 \rangle$	0	—	45.77 ± 0.02	key value
$\langle \text{N} \rangle$	112.97	key value	36.613	key value
$\langle \text{NH}_3 \rangle$	-10.98 ± 0.1	key value	46.05 ± 0.02	key value
$\langle \text{N}_2\text{O} \rangle$	19.61 ± 0.1	817	52.55 ± 0.03	125
$\langle \text{NO} \rangle$	21.58 ± 0.06	817	50.35 ± 0.03	125
$\langle \text{N}_2\text{O}_3 \rangle$	19.8 ± 0.2	817	73.9 ± 0.5	817
$\langle \text{NO}_2 \rangle$	7.91 ± 0.2	817	57.34 ± 0.03	817
$\langle \text{N}_2\text{O}_4 \rangle$	2.17 ± 0.4	817	72.72 ± 0.2	817
$\langle \text{N}_2\text{O}_5 \rangle$	2.7 ± 0.3	817	82.8 ± 1.0	817
$\langle \text{NH}_4\text{F} \rangle$	-110.8 ± 0.6	907	17.2 ± 0.1	707
$\langle \text{NH}_4\text{Cl} \rangle$	-75.1 ± 0.2	907	22.9 ± 0.5	907
$\langle \text{NH}_4\text{Br} \rangle$	-56.56 ± 0.2	907	26.97 ± 0.1	—
$\langle \text{NH}_4\text{I} \rangle$	-48.04	907	—	—
$\langle (\text{NH}_4)_2\text{SO}_4 \rangle$	-282.1 ± 0.18	907	52.6 ± 0.3	907
$\langle \text{Na} \rangle$	0	—	12.25 ± 0.05	568, 186, 828
$\langle \text{Na} \rangle$	26.0 ± 0.6	293	36.7 ± 0.1	293
$\langle \text{Na}_2 \rangle$	33.7 ± 1.0	293	55.0 ± 0.2	293
$\langle \text{NaH} \rangle$	-13.5 ± 0.2	702	9.55 ± 0.1	702
$\langle \text{NaF} \rangle$	-137.52 ± 0.2	817	12.24 ± 0.02	817
$\langle \text{NaF} \rangle$	-69.42 ± 0.5	817	51.98	817
$\langle \text{NaCl} \rangle$	-98.62 ± 0.1	817	17.24 ± 0.05	817
$\langle \text{NaCl} \rangle$	-43.36 ± 0.5	817	54.9	817
$\langle \text{NaBr} \rangle$	-86.45 ± 0.3	817	20.75 ± 0.06	817
$\langle \text{NaBr} \rangle$	-34.4 ± 0.5	817	57.63	817
$\langle \text{NaI} \rangle$	-68.8 ± 0.2	817	23.5	817
$\langle \text{NaClO}_4 \rangle$	-91.48	817	34.0	817
$\langle \text{Na}_2\text{O} \rangle$	-99.2 ± 0.7	817	17.94	817
$\langle \text{NaO} \rangle$	$+25.2 \pm 5.0$	867	54.0 ± 1.0	867
$\langle \text{Na}_2\text{O}_2 \rangle$	-123.0 ± 1.5	817	22.6 ± 0.3	243
$\langle \text{NaO}_2 \rangle$	-62.5 ± 1.0	—	27.7 ± 0.3	243
$\langle \text{NaOH} \rangle$	-101.8 ± 0.2	817 (1974)	15.4 ± 0.2	580
$\langle \text{NaOH} \rangle$	-47.3 ± 3.0	817 (1974)	54.57 ± 0.1	817 (1974)
$\langle \text{Na}_2\text{S} \rangle$	-89.5 ± 3.0	854	19.0 ± 3.0	854

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	1850	—	—	* from oxides (MnO , Al_2O_3)
—	—	—	—	* from oxides
—	—	—	—	* from oxides
—	2620	4600	Na	—
—	—	—	—	—
—	7.5	34	—	—
—	194	264	NbCl_5	—
—	—	—	—	—
—	317	410	—	—
—	—	—	—	—
—	—	—	monoclinic	—
—	800	—	Table Aa	—
—	—	—	—	—
—	—	—	—	—
—	1185	—	hexagonal	—
—	—	—	—	—
—	—	—	—	—
—	[2430]	—	hexagonal	† $\text{MoN}_{0.49-0.53}$
—	Sb	102	A_{15}	‡ $\text{MoC}_{0.44-0.50}$
—	—	—	A_{15} , Cr_3Si	—
—	—	—	D8m, cubic	—
—	—	—	C11, tetrag.	—
—237.5	-210	-196	—	—
—	—	—	—	—
—	-78	-33.5	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
16	—	—	—	—
185	520	—	—	—
140	542	—	—	—
-13	551	—	—	—
—	—	—	—	—
—	98	882	Table Aa	—
—	—	—	—	—
—	—	—	—	—
—	—	—	NaCl	—
—	996	1787	NaCl	—
—	—	—	—	—
—	801	1465	Table Aa	—
—	—	—	—	—
—	747	1393	NaCl	—
—	—	—	—	—
—	660	1304	NaCl	—
—	308	—	—	—
750, 970	1132	—	CaF_2	—
—	—	—	—	—
—	675	—	tetragonal	—
—	—	—	KO_2	—
299	323	(1560)	tetragonal	—
—	—	—	—	—
—	978	—	CaF_2	—

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{NaS} \rangle$	-48.1 ± 1.7	854	10.7 ± 2.5	854
$\langle \text{Na}_2\text{S}_2 \rangle$	-103.4 ± 5.0	854	24.3 ± 5.0	854
$\langle \text{NaS}_2 \rangle$	-49.2 ± 2.8	854	20.0 ± 3.3	854
$\langle \text{Na}_2\text{SO}_4 \rangle$	333.5 ± 2.0	—	35.73 ± 0.1	285, 828
$\langle \text{Na}_2\text{Se} \rangle$	-82.0 ± 3.0	895	—	—
$\langle \text{NaSe} \rangle$	-46.4 ± 5.0	854	15.0 ± 2.5	854
$\langle \text{Na}_2\text{Te} \rangle$	-82.0 ± 6.0	917	22.6 ± 4.0	917
$\langle \text{NaTe} \rangle$	-41.4 ± 2.5	917	20.0 ± 3.5	917
$\langle \text{NaTe}_3 \rangle$	-50.3 ± 5.0	917	34.7 ± 5.5	917
$\langle \text{Na}_3\text{As} \rangle$	-52.0 ± 6.0	—	—	—
$\langle \text{Na}_3\text{Sb} \rangle$	-47.2 ± 3.0	264	42.1 ± 4.0	—
$\langle \text{NaSb} \rangle$	-15.8 ± 1.0	264	23.83 ± 3.0	—
$\langle \text{Na}_3\text{Bi} \rangle$	-45.5 ± 3.0	264	(38.2)	—
$\langle \text{NaBi} \rangle$	-15.6 ± 1.0	264	(26.2)	—
$\langle \text{Na}_2\text{CO}_3 \rangle$	-270.3 ± 0.4	860	33.17 ± 0.2	860
$\langle \text{Na}_4\text{SiO}_4 \rangle$	$-86.0 \pm 5.0^*$	840	46.8 ± 0.6	125
$\langle \text{Na}_2\text{SiO}_3 \rangle$	$-55.5 \pm 3.5^*$	921	27.2 ± 0.3	125
$\langle \text{Na}_2\text{Si}_2\text{O}_5 \rangle_x$	$-55.1 \pm 2.0^*$	840	39.4 ± 0.6	125
$\langle \text{Na}_2\text{TiO}_3 \rangle$	$-51.0 \pm 4.0^*$	—	29.1 ± 0.2	125
$\langle \text{Na}_2\text{Ti}_2\text{O}_5 \rangle$	$-55.5 \pm 5.0^*$	—	41.5 ± 0.3	125
$\langle \text{Na}_2\text{Ti}_3\text{O}_7 \rangle$	$-56.7 \pm 5.0^*$	—	55.9 ± 0.5	125
$\langle \text{Na}_4\text{Sn} \rangle$	-14.0 ± 1.0	264	—	—
$\langle \text{Na}_2\text{Sn} \rangle$	-14.4 ± 1.0	264	—	—
$\langle \text{NaSn} \rangle$	-12.0 ± 0.8	264	—	—
$\langle \text{Na}_5\text{Pb}_2 \rangle$	-34.3 ± 2.5	307	81.3 ± 9.0	—
$\langle \text{NaPb} \rangle$	-11.0 ± 1.0	307	23.6 ± 3.0	—
$\langle \text{Na}_2\text{Pb}_5 \rangle^\dagger$	-23.0 ± 2.0	307	98.5 ± 9.0	—
$\langle \text{NaTi} \rangle$	-9.0 ± 1.0	264	—	—
$\langle \text{NaCd}_2 \rangle$	-7.0 ± 1.2	840	32.8 ± 2.2	—
$\langle \text{Na}_3\text{AlF}_6 \rangle$	$-19.8 \pm 0.2^*$	797	57.0 ± 0.4	379
$\langle \text{NaAlO}_2 \rangle$	$-20.9 \pm 1.2^*$	359	16.9 ± 0.2	378
$\langle \text{Na}_2\text{CrO}_4 \rangle$	-317.6 ± 1.9	896	44.4 ± 1.9	797
$\langle \text{NaCrO}_2 \rangle$	$-24.25 \pm 0.5^*$	840	19.9 ± 1.6	—
$\langle \text{NaFeO}_2 \rangle$	-10.5 ± 2.0	—	21.1 ± 0.2	—
$\langle \text{Na}_2\text{MoO}_4 \rangle$	-350.4 ± 9.0	—	38.1 ± 0.3	840
$\langle \text{NaVO}_3 \rangle$	$-38.7 \pm 1.5^*$	711	27.2 ± 0.3	711
$\langle \text{Na}_4\text{V}_2\text{O}_7 \rangle$	$-127.7 \pm 4.0^*$	711	76.1 ± 0.8	711
$\langle \text{Na}_3\text{VO}_4 \rangle$	$-85.4 \pm 2.5^*$	711	45.3 ± 0.5	711
$\langle \text{Nb} \rangle$	0	—	8.73 ± 0.15	99
$\langle \text{Nb} \rangle$	$+172.4 \pm 4.0$	99	44.48	99
$\langle \text{NbF}_5 \rangle$	-433.5 ± 1.0	660, 172	38.3 ± 0.7	445
$\langle \text{NbF}_5 \rangle$	-415.2	755	78.63	—
$\langle \text{NbCl}_3 \rangle$	-139.0 ± 3.0	602	35.2 ± 2.5	602
$\langle \text{NbCl}_4 \rangle$	-166.0 ± 2.5	602	44.0 ± 2.5	602
$\langle \text{NbCl}_5 \rangle$	-190.5 ± 1.0	763, 602	54.0 ± 2.5	602
$\langle \text{NbBr}_5 \rangle$	-131.53	752	3.0	752
$\langle \text{NbI}_5 \rangle$	-64.7	752	1.0	752
$\langle \text{NbOCl}_2 \rangle$	-185.0 ± 2.0	604	—	—
$\langle \text{NbOCl}_3 \rangle$	-210.2 ± 2.5	602	38.0 ± 2.5	602
$\langle \text{NbO} \rangle$	-100.3 ± 3.0	817 (1975)	11.0 ± 2.0	817
$\langle \text{NbO}_2 \rangle$	-190.0 ± 2.0	817 (1975)	13.03 ± 0.07	817
$\langle \text{Nb}_2\text{O}_3 \rangle$	-454.0 ± 1.2	817 (1975)	32.82 ± 0.3	303
$\langle \text{Nb}_2\text{N} \rangle$	-59.4 ± 1.5	755	16.0 ± 1.2	755
$\langle \text{NbN} \rangle$	-55.9 ± 1.5	755	9.0 ± 1.0	755
$\langle \text{Nb}_2\text{C} \rangle$	-44.5 ± 2.0	755	15.3 ± 0.1	755
$\langle \text{NbC} \rangle$	-33.0 ± 1.0	755	8.38 ± 0.1	755

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	480	—	—	—
—	353	—	—	—
—	185	—	—	—
249, 707	884	—	orthorhomb.	—
—	900	—	CaF_2	—
—	495	—	—	—
—	953	—	CaF_2	—
—	377	—	—	—
—	455	—	—	—
—	—	—	Na_3Bi	—
—	856	—	Na_3Bi	—
—	475	—	monoclinic	—
—	848	—	hexagonal	—
—	446	—	In, super 1	—
450	850	—	—	—
—	1120	—	—	*from oxides
—	1088	—	orthorhomb.	*from oxides
678, 707	874	—	orthorhomb.	*from oxides
287	1030	—	—	*from oxides
—	985	—	—	*from oxides
—	1128	—	—	*from oxides
—	405	—	orthorhomb.	—
—	477	—	—	—
—	576	—	—	—
—	400	—	—	—
—	368	—	—	—
—	320	—	Ag, super 1	† $\text{NaPb}_{1.85} = 2.7$
—	306	—	Table Aa	—
—	382	—	—	—
568, 880	1012	—	—	*from fluorides
—	1560	—	—	*from oxides
421	797	—	—	—
—	—	—	—	*from oxides
—	1072	—	—	*from oxides
485, 593, 642	698	—	—	—
—	—	—	—	*from oxides
—	—	—	—	*from oxides
—	—	—	—	*from oxides
—	2468	4750	Na	—
—	—	—	—	—
—	79	233	monoclinic?	—
—	—	—	—	—
—	—	—	—	—
—	—	455	—	—
—	205	247	monoclinic	—
—	227	272	orthorhomb.	—
—	327	347	—	—
—	—	—	—	—
—	—	335	—	—
—	1935	—	hexagonal	—
817, 927	1902	—	c. rutile	—
—	1510	—	Ta_2O_3	—
—	—	—	Co_2N	—
1370	2630	—	hexagonal	—
—	—	—	Co_2N	—
—	—	—	NaCl	—

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{NbB}_2 \rangle$	-60.0 ± 4.0	740	9.0 ± 0.1	740
$\langle \text{NbSi}_2 \rangle$	-33.0 ± 11.0	840	16.7 ± 2.5	—
$\langle \text{NbFe}_2 \rangle$	-14.7 ± 3.0	755	18.0 ± 2.0	755
$\langle \text{NbCr}_2 \rangle$	-5.0 ± 0.7	849	20.0 ± 0.05	849
$\langle \text{Nd} \rangle$	0	—	17.0 ± 1.0	99
$\langle \text{NdH}_2 \rangle$	-46.0	918	14.08 ± 0.08	759
$\langle \text{NdF}_3 \rangle$	-399.0 ± 9.0	742	27.6	—
$\langle \text{NdCl}_3 \rangle$	-245.6 ± 2.0	918	34.4 ± 2.2	—
$\langle \text{NdI}_3 \rangle$	-150.2 ± 2.5	233, 779	—	—
$\langle \text{NdOCl} \rangle$	-241.7 ± 2.0	793	22.6 ± 2.0	—
$\langle \text{Nd}_2\text{O}_3 \rangle$	-432.1 ± 1.2	683	37.9 ± 0.1	846
$\langle \text{Nd}_2\text{S}_3 \rangle$	-276.0 ± 9.0	854	44.28 ± 0.2	854
$\langle \text{Nd}_2(\text{SO}_4)_3 \rangle$	(-932.0)	233, 772	68.9	—
$\langle \text{Nd}_2\text{Zr}_2\text{O}_7 \rangle$	-10.54*	832	62.0 ± 2.7	—
$\langle \text{Ni} \rangle$	0	—	7.14 ± 0.05	125
$\langle \text{Ni} \rangle$	$+102.8 \pm 0.5$	99	43.52	99
$\langle \text{NiF}_2 \rangle$	-157.0 ± 0.9	907	17.6 ± 0.1	356
$\langle \text{NiCl} \rangle$	-55.0 ± 9.0	597	57.5 ± 2.5	597
$\langle \text{NiCl}_2 \rangle$	-73.0 ± 0.5	30, 399	23.35 ± 0.2	30, 828
$\langle \text{NiBr}_2 \rangle$	-50.7 ± 2.4	918	32.5 ± 2.4	—
$\langle \text{NiI}_2 \rangle$	-18.7 ± 2.0	918	36.8 ± 2.4	—
$\langle \text{NiO} \rangle$	-57.5 ± 0.5	307	9.1 ± 0.1	379
$\langle \text{Ni}_3\text{S}_2 \rangle$	-51.6 ± 2.5	854	32.0 ± 0.3	636
$\langle \text{NiS}_{0.84} \rangle$	-19.7 ± 1.1	854	11.7 ± 1.0	854
$\langle \text{NiS} \rangle$	-22.5 ± 0.9	854	12.65 ± 0.2	636
$\langle \text{NiSO}_4 \rangle$	-208.7 ± 0.6	907	24.82 ± 0.25	907
$\langle \text{NiSe}_{1.05} \rangle$	-17.9 ± 0.9	854	17.97 ± 1.0	854
$\langle \text{NiSe}_{1.143} \rangle$	-19.05 ± 0.6	854	18.44 ± 1.0	854
$\langle \text{NiSeO}_3 \rangle$	-135.6 ± 1.6	854	24.7 ± 2.0	854
$\langle \text{NiTe} \rangle$	-8.52 ± 0.44	875	19.13 ± 0.35	—
$\langle \text{Ni}_3\text{N} \rangle$	$+0.2 \pm 1.0$	770	—	—
$\langle \text{Ni}_3\text{P} \rangle$	-47.83 ± 2.5	—	25.4 ± 3.2	—
$\langle \text{Ni}_5\text{P}_2 \rangle$	-93.5 ± 4.5	—	44.2 ± 5.1	—
$\langle \text{Ni}_2\text{P} \rangle$	-39.3 ± 4.0	—	18.5 ± 2.8	—
$\langle \text{Ni}_6\text{P}_5 \rangle$	-132.9 ± 14.0	—	66.0 ± 7.5	—
$\langle \text{NiP}_2 \rangle$	-30.9 ± 3.5	—	17.5 ± 4.0	—
$\langle \text{NiP}_3 \rangle$	-37.7 ± 4.0	—	23.5 ± 4.0	—
$\langle \text{NiAs} \rangle$	-17.2 ± 0.9	—	12.4 ± 2.7	—
$\langle \text{NiSb} \rangle$	-20.0 ± 1.2	—	18.7 ± 3.0	—
$\langle \text{NiBi} \rangle$	-1.85 ± 0.4	—	21.1 ± 1.0	—
$\langle \text{NiCO}_3 \rangle$	-162.5 ± 3.0	886	20.4 ± 0.4	833
$\langle \text{Ni}(\text{CO})_4 \rangle$	-37.9 ± 1.5	907	99.3 ± 0.2	907
$\langle \text{Ni}_2\text{Si} \rangle$	-34.1 ± 2.6	840	—	—
$\langle \text{Ni}_3\text{Si}_2 \rangle$	-55.5 ± 4.6	840	—	—
$\langle \text{NiSi} \rangle$	-21.4 ± 1.8	840	10.6 ± 0.8	840
$\langle \text{NiSi}_2 \rangle$	-22.5 ± 3.0	840	15.6 ± 1.1	840
$\langle \text{Ni}_2\text{Ge} \rangle$	-26.3 ± 1.4	—	21.7 ± 2.5	—
$\langle \text{Ni}_3\text{Ti} \rangle$	-33.5 ± 1.5	152	25.0 ± 2.7	—
$\langle \text{NiTi} \rangle$	-15.9 ± 1.0	152	12.7 ± 1.8	—
$\langle \text{NiTi}_2 \rangle$	-20.0 ± 1.5	152	20.0 ± 1.5	—
$\langle \text{Ni}_3\text{Sn} \rangle$	-24.6 ± 2.6	—	31.4 ± 4.4	—
$\langle \text{Ni}_3\text{Sn}_2 \rangle$	-46.05 ± 1.2	—	41.5 ± 4.5	—
$\langle \text{Ni}_3\text{Sn}_4 \rangle$	-56.3 ± 0.9	—	61.6 ± 4.5	—
$\langle \text{Ni}_4\text{B}_1 \rangle$	-74.5 ± 12.0	—	27.4 ± 4.5	—
$\langle \text{NiB} \rangle$	-24.0 ± 4.0	—	7.2 ± 1.5	—
$\langle \text{Ni}_3\text{Al} \rangle$	-36.6 ± 2.0	—	27.2 ± 1.0	—

standard entropies and structures (contd.)

tr. pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	—	—	—	—
—	—	—	—	—
1600	1650	—	—	—
—	1740	—	—	—
855	1016	3070	Mg	—
—	—	—	—	—
—	1377	—	—	—
—	760	—	UCl ₃	—
574	785	—	—	—
—	—	—	—	—
140	2272	—	La ₂ O ₃	—
—	2210	—	—	—
—	—	—	—	—
—	—	—	—	*from oxides
—	1453	2910	Ag	—
—	—	—	—	—
—	1450	1474	rutile	—
—	—	—	—	—
—	1009	970	CdCl ₂	—
—	963	919	CdCl ₂	—
750	797	—	CdCl ₂	—
252	1955	—	NaCl	—
550	[790]	—	—	—
391	[560]	—	—	NiS _{0.82-0.867}
389	996	—	NiAs	—
—	—	—	—	—
320, 660 (230)	980	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	NiAs	—
—	—	—	Mg	—
—	[970]	—	cubic b.c.	—
1025	1180	—	—	—
—	1110	—	Fe ₂ P	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	964	—	Table Aa	—
—	1160	—	NiAs	—
—	[655]	—	—	—
—	—	—	—	—
—	—	—	—	—
1214	1318	—	orthorhomb.	—
[845]	—	—	Ag, superstr.	—
—	992	—	FeSi	—
—	980	—	—	—
—	—	—	—	—
—	1378	—	hexagonal	—
—	1240	—	CsCl	—
—	1015	—	f.c.c.	—
921	1174	—	MgCd ₃	—
—	1264	—	NiAs	—
—	—	—	—	—
—	1540	—	—	—
—	[1600]	—	—	—
—	—	—	AuCu ₃	—

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	410	832	CdI ₂	
489	886	—	tetragonal	
—	—	—	—	
—	dec.	596	tetragonal	
—	—	—	rutile	
—	1113	—	NaCl	
—	—	—	—	
866	1170	—	BaSO ₄	
—	1076	—	NaCl	
—	—	—	—	
—	680	—	—	
—	920	—	NaCl	
—	—	—	BaCO ₃	
—	—	—	—	
—	743	—	—	*from oxides
—	764	—	monoclinic	*from oxides
490	1170	—	CaTiO ₃ , def.	
—	722	—	—	*from oxides
—	960	—	—	*from oxides
—	940	—	—	*from oxides
—	1125	—	—	*from oxides
37, 125	1552	2940	Ag	
627	—	—	—	
—	—	—	—	
—	678	—	orthorhomb.	
—	—	—	—	
—	dec.	—	—	
—	—	—	Table Aa	
—	—	—	—	
—	—	—	—	
—	972	—	—	
—	—	—	—	
795	931	3510	M ₂	
—	—	—	—	
—	—	—	—	
—	786	—	UCl ₃	
—	738	—	—	
—	—	—	La ₂ O ₃	
—	—	—	CaF ₂	
—	2230	—	—	
—	—	—	—	
—	—	—	—	
—	1769	(4100)	Ag	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	PdO	
—	—	—	CdI ₂	
—	—	—	—	

† PtS₀₋₉₇₅₋₁₋₀₂₅

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
<Pu>	0	—	13.2 ± 0.5	595
<PuH ₂ >	-33.3 ± 1.8	865	14.3 ± 1.2	865
<PuH ₃ >	-33.0 ± 4.0	865	15.5 ± 1.2	865
<PuF ₃ >	-371.0 ± 4.0	865	27.0 ± 3.0	865
<PuF ₄ >	-414.4 ± 5.0	865	38.7 ± 0.5	595
<PuF ₆ >	-424.6 ± 7.0	865	53.2 ± 0.7	865
(PuF ₆)	-413.0 ± 7.0	865	88.3 ± 0.2	865
<PuCl ₃ >	-226.8 ± 0.8	595	39.2 ± 3.0	595
<PuOCl>	-219.7 ± 1.0	595	25.2 ± 3.0	595
<PuBr ₃ >	-198.8 ± 0.6	865	45.7 ± 3.0	595
<PuOBr>	-212.4 ± 5.0	865	28.5 ± 2.0	865
<PuI ₃ >	(-143.0)	865, 595	53.5 ± 5.0	865, 595
<PuOI>	-197.8 ± 5.0	865	30.2 ± 3.0	865
<PuO ₂ >	-252.4 ± 0.4	818	16.35 ± 0.5	818
<PuS>	-104.3 ± 5.0	865	18.7 ± 1.5	865
<Pu ₂ S ₃ >	-235.0 ± 4.5	865	46.0 ± 4.0	865
<Pu(SO ₄) ₂ >	-526.0 ± 5.0	865	39.0 ± 2.5	865
<PuN>	-71.5 ± 1.6	—	17.3 ± 0.6	—
<PuC _{0.88} >	-11.1 ± 0.8	766	17.3 ± 0.6	766
<PuC _{1.5} >	-13.2 ± 1.0	766	20.7 ± 1.0	766
<PuC ₂ >	-8.25 ± 2.5	—	24.1 ± 1.0	766
<Rb>	0	—	18.35 ± 0.1	99
<RbF>	-132.2 ± 1.8	772	17.6 ± 1.7	—
<RbCl>	-102.9 ± 2.0	772	21.9 ± 0.8	906, 155
<RbBr>	-93.0 ± 2.0	772	26.0 ± 0.2	36
<RbI>	-78.5 ± 2.0	772	28.2 ± 0.2	36
<Rb ₂ O>	-78.9 ± 3.0	772	—	—
<Rb ₂ O ₃ >	-126.0 ± 10.0	22	—	—
<RbO ₂ >	-68.0 ± 6.0	22	—	—
<RbOH>	-98.9 ± 4.0	772	—	—
<Rb ₂ S>	-83.2 ± 6.0	772	31.8 ± 3.0	854
<Rb ₂ SO ₄ >	-340.5 ± 2.5	772	—	—
<Rb ₂ CO ₃ >	-269.6 ± 4.0	772	41.8	861
<Re>	0	—	8.73 ± 0.1	99
(Re)	+185.2 ± 3.0	99	45.13	627
<ReF ₆ >	-278.0 ± 12.0	399	—	—
<ReCl ₃ >	-63.0 ± 2.5	547	29.6 ± 0.1	666
<ReBr ₃ >	-39.3 ± 2.5	547	35.0 ± 2.5	666
<ReO ₂ >	-103.4 ± 1.2	787	15.0 ± 1.1	—
<ReO ₃ >	-146.0 ± 4.0	284	19.3 ± 2.0	787
<Re ₂ O ₇ >	-298.4 ± 2.5	787	49.55 ± 0.1	284
<ReS ₂ >	-42.7 ± 2.5	163	14.5 ± 2.0	854
<ReS ₃ >	-49.8 ± 3.3	—	18.0 ± 3.0	854
<Re ₂ S ₇ >	-107.9 ± 4.0	163	40.0 ± 5.0	854
<Re ₂ Te ₆ >	-29.3 ± 6.0	869	60.2 ± 8.0	869
<Re ₃ As ₇ >	-22.8 ± 4.0	—	80.5 ± 6.0	—
<Re ₃ Si ₃ >	-37.6 ± 15.0	840	61.15 ± 4.0	840
<ReSi>	-12.6 ± 5.0	840	13.23 ± 1.0	840
<ReSi ₂ >	-21.6 ± 7.5	840	17.7 ± 1.6	840
<Rh>	0	—	7.53 ± 0.05	99
(Rh)	+132.2 ± 1.5	99	44.39	99
<RhCl ₃ >	-65.8 ± 6.0	435	30.3 ± 3.5	435
<RhBr ₃ >	-50.0 ± 4.0	27	45.0 ± 7.0	27
<Rh ₂ O ₃ >	-91.5 ± 4.0	828	22.0 ± 3.5	—
(RhO ₂)	-46.8 ± 2.0	831	63.0 ± 2.5	831

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
122, 205, 318, 452	640	3420	orthorhomb.	
—	—	—	—	
—	—	—	—	
—	1426	—	CeF ₃	
—	1037	—	—	
—	52	—	—	
—	—	—	—	
—	767	1790	UCl ₃	
—	—	—	orthorhomb.	
—	681	1475	—	
—	—	—	—	
—	780	—	—	
—	—	—	—	
—	2390	—	—	
—	2350	—	—	
—	1730	—	—	
—	—	—	—	
—	2570	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	38	688	Na	
—	775	1390	NaCl	
—	715	1381	NaCl	
—	680	1352	NaCl	
—	640	1304	NaCl	
—	> 570	—	CaF ₂	
—	489	—	cubic†	† Th ₃ P ₄ type
—	412	—	CaC ₂	
245	300	—	—	
—	—	—	CaF ₂	
649	1050	—	K ₂ SO ₄	
—	840	—	—	
—	3180	5600	Mg	
—	—	—	—	
—	19	34	—	
—	—	—	—	
—	—	—	—	
—	—	—	MoO ₂	
—	—	—	cubic†	† approaching c.p.
—	297	361	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	935	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	1960	3700	Mg	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	Cr ₂ O ₃	

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	2250	4150	Mg	
—	—	—	—	
—	101	272	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	rutile	
—	—	—	—	
—	—	—	pyrite	
95.5	—	445	Table Aa	† orthorhombic
—	115	445	Table Aa	‡ monoclinic
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—179	Sb.	—64	—	
—	—30	—	—	
—	—80	138	—	
—	—	—	—	
—	—	—	—	
—	—	70	—	
—	—	—	—	
—	—	44.5	—	
—	—	—	—	
—	—	—	—	
—	631	1587	As	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	291	319	—	
—	73	—	—	
—	—	—	—	
—	2	—	—	
—	dec.	—	—	
—	97	289	—	
—	170	402	AsI ₃	
<572>	656	1456	orthorhomb.	
—	—	—	cubic	
—	—	—	cubic	
—	550	—	Bi ₂ S ₃	† black
—	—	—	—	
—	615	—	—	
—	619	—	—	
1335	1539	2930	Mg	
—	—	—	—	
—	—	—	—	
—	966	967	AsI ₃	
—	Sb	929	—	
—	<2400	—	Table Aa	
—	—	—	—	
—	(2650)	—	NaCl	

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
<Se>	0	—	10.1 ± 0.1	854
(Se)	56.25	854	24.21 ± 0.05	854
(Se ₂)	33.3 ± 0.5	854	58.2 ± 0.9	854
{SeF ₄ }	-204.8	854	44.3	854
(SeF ₄)	-194.0 ± 9.0	854	70.85	854
(SeF ₆)	-266.95 ± 0.2	854	74.92	854
{SeCl ₂ }	-20.0 ± 1.0	854	59.0 ± 5.0	854
(Se ₂ Cl ₂)	-5.2 ± 2.0	854	84.56	854
(SeCl ₂)	-8.0 ± 3.0	854	70.65	854
<SeCl ₄ >	-45.1 ± 1.5	854	46.5 ± 4.0	854
(SeO)	14.9 ± 5.0	854	55.9	854
<SeO ₂ >	-53.8 ± 0.5	854	15.94 ± 0.4	854
(SeO ₂)	-25.8 ± 4.0	854	63.31	854
<Si>	0	—	4.5 ± 0.05	125
(Si)	108.9 ± 1.2	99	40.12	99
(Si ₂)	142.0 ± 1.8	99	54.92	99
(Si ₃)	147.0 ± 2.5	99	60.63	99
(SiH ₄)	-7.3 ± 0.8	578	48.7 ± 0.1	125
(Si ₂ H ₆)	19.1 ± 0.4	907	65.55 ± 0.4	907
(SiCl ₂)	-40.0 ± 1.0	817	67.36 ± 1.0	817
(SiCl ₄)	-158.4 ± 0.4	817	79.07 ± 0.1	817
(SiBr ₂)	-10.2 ± 2.0	907	72.5 ± 0.5	907
{SiBr ₄ }	-110.3 ± 1.0	907	—	—
(SiBr ₄)	-100.3 ± 1.2	907	90.2 ± 0.3	907
(SiI ₂)	19.6 ± 1.5	—	75.8 ± 0.6	907
<SiI ₄ >	-47.6 ± 1.5	890	63.44 ± 1.2	—
(SiO)	-23.5 ± 2.5	215	50.55 ± 0.1	125
<SiO ₂ >	-217.6 ± 0.8	817	9.91 ± 0.05	817
(SiS)	+25.3 ± 3.0	817	53.46 ± 0.5	817
<SiS ₂ >	-51.0 ± 5.0	817	19.2 ± 1.0	—
(SiSe)	+48.5 ± 5.0	854	56.2 ± 0.3	854
<SiSe ₂ >	-35.0 ± 9.0	854	22.5 ± 3.0	854
<Si ₃ N ₄ >	-178.0 ± 3.0	817	27.0 ± 2.0	817
<SiP>	-14.8 ± 3.5	—	7.8 ± 2.3	—
<SiC>	-16.0 ± 1.5	840	3.95 ± 0.05	125
<Sm>	0	—	16.62 ± 0.1	534
(Sm)	+49.6 ± 1.5	405	43.72	99
<SmCl ₂ >	-195.6 ± 1.1	383	30.5 ± 1.5	—
<SmCl ₃ >	-245.2	918	34.8	—
<SmOF>	-274.6 ± 2.5	920	22.5 ± 4.0	920
<Sm ₂ O ₃ >	-437.9 ± 2.0	—	36.1 ± 0.1	536
<SmC ₂ >	-23.4 ± 2.0	—	18.6 ± 2.0	—
<Sn> _{white}	0	—	12.24 ± 0.1	99
<Sn> _{grey}	+0.47 ± 0.03	99	10.55 ± 0.1	99
(Sn)	+72.0 ± 0.5	99	40.24	99
(SnH ₄)	+38.9 ± 0.8	907	54.65 ± 0.1	907
<SnCl ₂ >	-79.1	907	31.5 ± 1.5	—
<SnCl ₄ >	-126.4 ± 3.5	907	61.9 ± 1.0	907
(SnCl ₄)	-116.9	907	87.2 ± 0.3	907
<SnBr ₂ >	-62.15 ± 1.6	907	35.8 ± 2.8	—
(SnBr ₄)	-83.2	907	98.6 ± 0.5	907
<SnI ₂ >	-34.7 ± 4.5	907	(40.1)	—
(SnI ₄)	—	—	106.7 ± 0.4	907
<SnO>	68.4 ± 0.3	98	13.5 ± 0.5	125
(SnO)	+5.0 ± 2.3	907	55.45 ± 0.05	907

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
(106)	220	685	Table Aa	—
—	—	—	—	—
—	10	108	—	—
—	—	—	—	—
—	-35	Sb	—	—
—	-85	—	—	—
—	—	—	—	—
—	—	—	—	—
—	305	—	—	—
—	—	—	—	—
—	340	330	—	—
—	—	—	—	—
—	1412	3280	diamond	—
—	—	—	—	—
—	—	—	—	—
-210	-185	-112	—	—
—	-131	-14.5	—	—
—	—	—	—	—
—	-70	58	—	—
—	—	—	—	—
—	5	153	—	—
—	—	—	—	—
—	—	—	—	—
—	123	301	SnI ₄	—
—	(1610)	—	—	—
574, 806	1722	—	—	—
—	—	—	—	—
—	1090	—	orthorhomb.	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
918	1072	1800	—	—
—	—	—	—	—
—	740	—	PbCl ₂	—
—	678	—	—	—
524, 922	—	—	—	—
922	2350	—	monoclinic	—
—	—	—	—	—
—	232	2605	Table Aa	—
—	—	—	diamond	—
—	—	—	—	—
—	—	—	—	—
—	247	670	orthorhomb.	—
—	-33	112	—	—
—	—	—	—	—
—	232	641	—	—
—	30	208	—	—
—	320	718	—	—
—	145	349	Table Aa	—
—	—	—	Table Aa	—
—	—	—	—	—

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{SnO}_2 \rangle$	-138.8 ± 0.5	907	12.5 ± 0.3	907
$\langle \text{SnS} \rangle$	-25.9 ± 0.8	724, 321	18.4 ± 0.2	133
$\langle \text{Sn}_3\text{S}_4 \rangle$	-88.5 ± 4.0	854	58.2 ± 4.0	854
$\langle \text{Sn}_2\text{S}_3 \rangle$	-63.0 ± 5.0	854	39.3 ± 3.6	854
$\langle \text{SnS}_2 \rangle$	-36.7 ± 5.0	854	20.9 ± 0.2	133
$\langle \text{SnSO}_4 \rangle$	-242.5 ± 7.5	—	33.12 ± 0.2	905
$\langle \text{Sn}(\text{SO}_4)_2 \rangle$	-389.4 ± 7.5	918	35.8	—
$\langle \text{SnSe} \rangle$	-21.2 ± 1.5	854	20.6 ± 1.5	—
$\langle \text{SnSe}_2 \rangle$	-29.8 ± 1.0	—	28.2 ± 2.0	—
$\langle \text{SnTe} \rangle$	-14.5 ± 0.35	762	23.6 ± 0.6	—
$\langle \text{Sr} \rangle$	0	—	12.5 ± 0.6	125
$\langle \text{Sr} \rangle$	$+39.2 \pm 0.4$	817	39.23	817
$\langle \text{SrH}_2 \rangle$	-43.0 ± 1.4	57	11.9 ± 1.6	702
$\langle \text{SrF}_2 \rangle$	-290.9 ± 0.7	817	19.63 ± 0.1	817
$\langle \text{SrCl}_2 \rangle$	-198.1 ± 0.6	817	27.45 ± 0.1	817
$\langle \text{SrBr}_2 \rangle$	-171.6 ± 0.6	817	34.3 ± 1.0	817
$\langle \text{SrI}_2 \rangle$	-134.2 ± 0.5	817	38.03 ± 0.2	817
$\langle \text{SrO} \rangle$	-141.5 ± 0.9	817	13.27 ± 0.1	817
$\langle \text{SrO}_2 \rangle$	-151.4 ± 3.6	918	14.1 ± 2.6	—
$\langle \text{SrS} \rangle$	-108.1 ± 8.0	198	16.5 ± 1.0	—
$\langle \text{SrSO}_4 \rangle$	-345.3 ± 5.0	198	28.2 ± 2.0	125
$\langle \text{SrSe} \rangle$	-95.0 ± 9.0	854	19.3 ± 1.5	854
$\langle \text{SrTe} \rangle$	-62.0 ± 8.0	—	—	—
$\langle \text{Sr}_3\text{N}_2 \rangle$	-93.4 ± 5.0	198	29.5 ± 2.5	—
$\langle \text{SrC}_2 \rangle$	-20.2 ± 4.0	683	17.0 ± 2.0	683
$\langle \text{SrCO}_3 \rangle$	-291.55 ± 2.0	918	23.2 ± 0.4	125
$\langle \text{SrSiO}_3 \rangle$	$-31.2 \pm 0.5^*$	342	23.0 ± 1.8	840
$\langle \text{Sr}_2\text{SiO}_4 \rangle$	$-50.0 \pm 0.8^*$	342	35.8 ± 2.0	840
$\langle \text{SrTiO}_3 \rangle$	$-32.0 \pm 1.7^*$	840	25.9 ± 0.3	840
$\langle \text{Sr}_2\text{TiO}_4 \rangle$	$-38.0 \pm 2.0^*$	840	38.0 ± 0.3	247
$\langle \text{SrHfO}_3 \rangle$	-18.7^*	844	27.0 ± 2.7	—
$\langle \text{SrAl}_2\text{O}_4 \rangle$	$-559.0 \pm 4.0^*$	—	26.0 ± 6.0	—
$\langle \text{SrMoO}_4 \rangle$	$-50.7 \pm 2.1^*$	840	30.8 ± 1.2	840
$\langle \text{SrWO}_4 \rangle$	$-44.5 \pm 4.5^*$	840	32.0 ± 1.2	840
$\langle \text{Ta} \rangle$	0	—	9.92 ± 0.04	99
$\langle \text{Ta} \rangle$	$+186.8 \pm 0.8$	99	44.24	99
$\langle \text{TaF}_5 \rangle$	-454.9 ± 1.8	755	41.0 ± 3.2	—
$\langle \text{TaF}_3 \rangle$	-435.5 ± 4.0	755	84.35 ± 4.0	755
$\langle \text{TaCl}_3 \rangle$	-132.2 ± 1.8	603	37.0 ± 2.0	601
$\langle \text{TaCl}_4 \rangle$	-169.5 ± 1.9	601	46.0 ± 2.0	601
$\langle \text{TaCl}_5 \rangle$	-205.3 ± 0.5	755	56.0 ± 2.0	601
$\langle \text{TaCl}_4 \rangle$	-136.7 ± 2.0	755	91.5 ± 2.5	755
$\langle \text{TaCl}_5 \rangle$	-182.4 ± 2.0	755	102.6 ± 2.5	755
$\langle \text{TaOCl}_3 \rangle$	-187.5 ± 3.3	606	87.0 ± 3.0	606
$\langle \text{TaBr}_3 \rangle$	-143.0 ± 1.5	79	—	—
$\langle \text{TaI}_3 \rangle$	—	—	—	—
$\langle \text{Ta}_2\text{O}_5 \rangle$	-489.0 ± 1.0	817	34.2 ± 0.3	125
$\langle \text{Ta}_2\text{N} \rangle$	-65.2 ± 1.8	755	17.8 ± 2.2	—
$\langle \text{Ta}_2\text{N} \rangle$	-60.3 ± 3.0	755	10.2 ± 0.4	755
$\langle \text{Ta}_2\text{C} \rangle$	-48.5 ± 3.4	755	20.0 ± 1.2	—
$\langle \text{TaC} \rangle$	-34.2 ± 0.8	755	10.13 ± 0.2	125
$\langle \text{Ta}_2\text{Si} \rangle$	-30.0 ± 6.0	840	25.2 ± 2.8	840
$\langle \text{Ta}_2\text{Si}_3 \rangle$	-80.0 ± 8.0	840	67.1 ± 6.5	840
$\langle \text{TaSi}_2 \rangle$	-28.5 ± 3.0	840	18.0 ± 1.6	840
$\langle \text{TaCr}_2 \rangle$	-6.45 ± 0.6	849	21.05 ± 0.05	849

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
425	(2000)	(2500)	rutile	
602	880	1276	NaCl, def.	
—	710	—	—	
—	—	—	—	
—	765	—	CdI ₂	
—	—	—	—	
—	—	—	—	
—	880	—	—	
—	675	—	—	
—	806	—	NaCl	
555	768	1381	Ag	
—	—	—	—	
—	—	—	—	
(1148, 1211)	1477	2486	CaF ₂	
729	875	2058	CaF ₂	
645	657	2146	—	
—	538	1908	—	
—	2460	—	NaCl	
—	—	—	CaC ₂	
—	—	—	NaCl	
—	2000	—	BaSO ₄	
—	—	—	NaCl	
—	—	—	NaCl	
—	1030	—	Ba ₃ N ₂	
—	—	—	—	
924	—	—	—	
—	1580	—	BaCO ₃	*from oxides
—	—	—	—	*from oxides
—	1910	—	—	*from oxides
—	[1855]	—	—	*from oxides
—	—	—	—	*from oxides
659	—	—	—	*from oxides
—	—	—	—	*from oxides
—	1535	—	—	*from oxides
—	3015	5450	Na	
—	—	—	—	
—	97	—	—	
—	—	—	—	
—	—	—	—	
—	217	234	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	263	347	—	
—	496	545	—	
—	1900	—	orthorhomb.	
—	(2700)	—	Co ₂ N	
—	2950	—	hexagonal	
—	—	—	—	
—	4000	—	NaCl	
—	—	—	—	
—	—	—	Ta ₅ Si ₃	
—	—	—	hexagonal	
1530	2020	—	—	

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{TaFe}_2 \rangle$	-13.8 ± 2.0	755	25.5 ± 1.5	755
$\langle \text{TaB}_2 \rangle$	-50.0	892	10.6	892
$\langle \text{Tb} \rangle$	0	—	17.52 ± 0.2	—
$\langle \text{TbCl}_3 \rangle$	-238.3 ± 2.3	918	35.3 ± 1.8	—
$\langle \text{Tb}_2\text{O}_3 \rangle$	-436.8 ± 2.0	240	—	—
$\langle \text{Tc} \rangle$	0	—	7.5 ± 0.5	—
$\langle \text{TcO}_2 \rangle$	-103.5 ± 3.0	284	14.0 ± 1.2	—
$\langle \text{TcO}_3 \rangle$	-129.0 ± 6.0	22	17.0 ± 1.5	—
$\langle \text{Tc}_2\text{O}_7 \rangle$	-266.0 ± 4.0	284	44.0 ± 2.5	—
$\langle \text{Te} \rangle$	0	—	11.83 ± 0.05	99
$\langle \text{Te} \rangle$	$+50.6 \pm 0.6$	854	43.64	854
$\langle \text{Te}_2 \rangle$	$+38.33 \pm 0.5$	854	61.87	854
$\langle \text{TeF}_6 \rangle$	-327.2 ± 0.8	718	80.25 ± 0.2	718
$\langle \text{TeCl}_4 \rangle$	-77.4 ± 2.0	854	48.0 ± 5.0	854
$\langle \text{TeBr}_4 \rangle$	-46.6 ± 2.2	907	58.2 ± 5.0	—
$\langle \text{TeO}_2 \rangle$	-77.3 ± 1.0	854	17.7 ± 1.5	854
$\langle \text{TeO}_2 \rangle$	-14.2 ± 2.0	854	65.7 ± 2.0	854
$\langle \text{Th} \rangle$	0	—	12.76 ± 0.05	75
$\langle \text{Th} \rangle$	$+142.7 \pm 2.5$	755	45.42	755
$\langle \text{ThH}_2 \rangle$	-34.3 ± 1.0	755	14.2 ± 1.2	755
$\langle \text{ThF}_4 \rangle$	-504.6 ± 2.0	755	33.95 ± 0.1	309
$\langle \text{ThF}_4 \rangle$	-424.3 ± 3.0	755	81.7 ± 3.0	755
$\langle \text{ThCl}_4 \rangle$	-283.6 ± 0.4	755	45.5 ± 1.0	755
$\langle \text{ThCl}_4 \rangle$	-233.0 ± 3.0	755	93.4 ± 2.0	755
$\langle \text{ThBr}_4 \rangle$	-230.8 ± 1.2	755	54.5 ± 1.5	755
$\langle \text{ThI}_4 \rangle$	(-159)	755	(63.5)	755
$\langle \text{ThOF}_2 \rangle$	-401.0 ± 4.0	755	24.2 ± 2.5	755
$\langle \text{ThOCl}_2 \rangle$	-294.8 ± 1.2	755	28.0 ± 2.5	755
$\langle \text{ThOBr}_2 \rangle$	-270.0 ± 4.0	755	31.3 ± 2.5	755
$\langle \text{ThOI}_2 \rangle$	-237.2 ± 1.0	755	34.6 ± 3.0	755
$\langle \text{ThO}_2 \rangle$	-293.2 ± 1.0	22	15.6 ± 0.03	317
$\langle \text{ThO} \rangle$	-6.8 ± 0.5	755	57.37 ± 0.1	755
$\langle \text{ThO}_2 \rangle$	-120.5 ± 5.0	755	61.6 ± 3.0	755
$\langle \text{Th}(\text{SO}_4)_2 \rangle$	-607.4 ± 4.0	569	39.5 ± 5.0	755
$\langle \text{ThS} \rangle$	-95.5 ± 1.5	755	16.68 ± 0.05	755
$\langle \text{Th}_2\text{S}_3 \rangle$	-258.9 ± 3.0	755	42.0 ± 3.0	755
$\langle \text{ThS}_2 \rangle$	-150.0 ± 9.0	755	23.0 ± 0.5	755
$\langle \text{ThN} \rangle$	-90.5 ± 2.5	755	13.7 ± 0.2	755
$\langle \text{Th}_3\text{N}_4 \rangle$	-312.0 ± 6.0	755	43.7 ± 0.5	755
$\langle \text{Th}_2\text{N}_2\text{O} \rangle$	-308.0 ± 5.0	755	29.7 ± 1.5	755
$\langle \text{ThP} \rangle$	-86.3 ± 9.0	820	16.8 ± 1.5	755
$\langle \text{Th}_3\text{P}_4 \rangle$	-285.5 ± 26.0	820	59.0 ± 7.0	755
$\langle \text{ThC}_{0.97} \rangle$	-30.0 ± 2.0	755	14.1 ± 0.2	755
$\langle \text{ThC}_{1.94} \rangle$	-28.0 ± 2.5	755	16.8 ± 0.1	755
$\langle \text{Th}_3\text{Si}_2 \rangle$	-66.8 ± 12.0	751	39.75 ± 7.0	751
$\langle \text{ThSi} \rangle$	-30.1 ± 4.0	751	15.0 ± 2.7	751
$\langle \text{Th}_3\text{Si}_2 \rangle$	-114.1 ± 20.0	751	55.4 ± 5.0	751
$\langle \text{ThSi}_2 \rangle$	-40.8 ± 7.0	751	21.3 ± 2.6	751
$\langle \text{ThAl}_3 \rangle$	-26.7 ± 4.5	755	23.2 ± 3.0	—
$\langle \text{ThRe}_2 \rangle$	-41.6 ± 1.2	884	29.55 ± 0.8	884
$\langle \text{ThMg}_2 \rangle$	-7.5 ± 1.2	864	22.1 ± 2.2	864
$\langle \text{Ti} \rangle$	0	—	7.32 ± 0.05	855, 828
$\langle \text{Ti} \rangle$	$+112.3 \pm 1.5$	52, 450, 15	43.07	—

standard entropies and structures (contd.)

tr.pt. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	—	—	—	—
—	3100	—	—	—
1290	1360	3220	—	—
510	582	—	—	—
—	—	—	Sc ₂ O ₃	—
—	2200	(4250)	—	—
—	—	—	MoO ₂	—
—	disp.	—	—	—
—	119	312	—	—
—	450	988	Se	—
—	—	—	—	—
—	—	—	—	—
-74	-39	—	—	—
—	224	416	—	—
—	380	421	—	—
—	733	—	rutile	—
—	—	—	—	—
1360	1750	4975	Ag	—
—	—	—	—	—
—	—	—	monoclinic	—
—	1110	1782	—	—
—	—	—	tetrag. b.c.	—
407	770	942	—	—
—	—	—	ThCl ₄	—
420	679	905	—	—
—	566	853	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	CaF ₂	—
—	3370	—	—	—
—	—	—	—	—
—	—	—	NaCl	—
—	—	—	hexagonal	—
—	2000	—	PbCl ₂	—
—	1917	—	—	—
—	2820	—	NaCl	—
—	dec.	—	—	—
—	—	—	—	—
—	2950	—	—	—
—	—	—	—	—
—	(2500)	—	—	—
1430, 1490	2610	—	—	—
—	1900	—	—	—
—	(1780)	—	—	—
—	1745	—	—	—
—	(1850)	—	—	—
—	1120	—	—	—
—	—	—	—	—
—	—	—	—	—
882	1670	3290	Mg	—
—	—	—	—	—

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{TiF}_3 \rangle$	-343.1 $\pm$ 9.0	817	21.0 $\pm$ 3.0	817
$\langle \text{TiF}_4 \rangle$	-394.2 $\pm$ 0.9	817	32.0 $\pm$ 0.1	477
$\langle \text{TiF}_4 \rangle$	-370.8 $\pm$ 1.1	817	75.24 $\pm$ 0.5	817
$\langle \text{TiCl}_2 \rangle$	-123.2 $\pm$ 4.0	817	20.88 $\pm$ 1.0	817
$\langle \text{TiCl}_3 \rangle$	-172.5 $\pm$ 1.0	817	33.4 $\pm$ 0.3	817
$\langle \text{TiCl}_3 \rangle$	-128.9 $\pm$ 1.5	817	75.7 $\pm$ 1.0	817
$\langle \text{TiCl}_4 \rangle$	-192.2 $\pm$ 0.9	817	60.33	817
$\langle \text{TiCl}_4 \rangle$	-182.4 $\pm$ 0.9	817	84.8 $\pm$ 0.7	817
$\langle \text{TiBr}_3 \rangle$	-131.4 $\pm$ 1.5	856	41.0 $\pm$ 2.5	856
$\langle \text{TiBr}_4 \rangle$	-148.0 $\pm$ 0.5	762, 407, 197	57.2 $\pm$ 0.5	856
$\langle \text{TiI}_2 \rangle$	-57.6 $\pm$ 6.0	84	33.0 $\pm$ 4.0	—
$\langle \text{TiI}_2 \rangle$	-2.2 $\pm$ 8.0	84	77.3 $\pm$ 4.0	—
$\langle \text{TiI}_4 \rangle$	-89.8 $\pm$ 2.0	817	58.8 $\pm$ 1.6	817
$\langle \text{TiI}_4 \rangle$	-66.27 $\pm$ 2.0	817	103.48 $\pm$ 2.0	817
$\langle \text{TiOCl} \rangle$	-184.2 $\pm$ 3.8	608	17.5 $\pm$ 2.0	608
$\langle \text{TiO} \rangle$	(-129.7)	817 (1975)	8.3 $\pm$ 0.5	828
$\langle \text{Ti}_2\text{O}_3 \rangle$	-363.5 $\pm$ 2.5	817 (1975)	18.46 $\pm$ 0.1	817 (1975)
$\langle \text{Ti}_3\text{O}_5 \rangle$	-587.8 $\pm$ 1.8	817 (1975)	30.93 $\pm$ 0.3	817 (1975)
Rutile	-225.8 $\pm$ 0.4	817 (1975)	12.03 $\pm$ 0.05	817 (1975)
$\langle \text{TiS} \rangle$	-65.0 $\pm$ 7.0	854	13.5 $\pm$ 2.0	854
$\langle \text{TiS} \rangle$	+79.0 $\pm$ 8.0	854	58.9 $\pm$ 0.5	854
$\langle \text{Ti}_5\text{Si}_3 \rangle$	-138.5 $\pm$ 15.0	—	52.1 $\pm$ 3.4	—
$\langle \text{TiSi} \rangle$	-31.0 $\pm$ 3.5	99	11.7 $\pm$ 1.8	—
$\langle \text{TiSi}_2 \rangle$	-32.1 $\pm$ 5.0	99	14.6 $\pm$ 2.2	—
$\langle \text{TiN} \rangle^\dagger$	-80.4 $\pm$ 0.8	788, 264	7.24 $\pm$ 0.1	828
$\langle \text{TiC} \rangle^\dagger$	-43.9 $\pm$ 1.5	788, 264	5.8 $\pm$ 0.2	828
$\langle \text{TiB}_2 \rangle$	-77.4 $\pm$ 0.9	700	6.81 $\pm$ 0.11	817
$\langle \text{TiAl} \rangle^\S$	-17.4 $\pm$ 0.6	839	12.5 $\pm$ 0.7	888
$\langle \text{TiAl}_3 \rangle$	-34.0 $\pm$ 1.0	839	22.6 $\pm$ 1.5	—
$\langle \text{Ti} \rangle$	0	—	15.34 $\pm$ 0.05	99
$\langle \text{Ti} \rangle$	+43.25 $\pm$ 0.3	99	43.23	99
$\langle \text{TiF} \rangle$	-77.8 $\pm$ 1.1	846	22.87 $\pm$ 0.05	846
$\langle \text{TiF}_3 \rangle$	-136.9 $\pm$ 2.5	418	—	—
$\langle \text{TiCl} \rangle$	-48.8 $\pm$ 0.4	918	26.6 $\pm$ 0.3	918
$\langle \text{TiCl}_3 \rangle$	-75.3 $\pm$ 2.5	918	36.4 $\pm$ 1.8	—
$\langle \text{TiBr} \rangle$	-41.27 $\pm$ 0.2	907	29.3 $\pm$ 0.1	907
$\langle \text{TiI} \rangle$	-29.56 $\pm$ 0.2	907	30.52 $\pm$ 0.05	907
$\langle \text{Ti}_2\text{O} \rangle$	-40.0 $\pm$ 1.8	907	32.1 $\pm$ 2.7	—
$\langle \text{Ti}_2\text{O}_3 \rangle$	-93.3 $\pm$ 1.4	907	32.8 $\pm$ 3.3	—
$\langle \text{Ti}_2\text{S} \rangle$	-22.7 $\pm$ 1.0	854	38.0 $\pm$ 3.0	854
$\langle \text{Ti}_2\text{SO}_4 \rangle$	-223.15 $\pm$ 0.2	907	48.0 $\pm$ 3.3	—
$\langle \text{Ti}_2\text{Se} \rangle^\dagger$	-22.5 $\pm$ 0.5	854	41.5 $\pm$ 1.5	854
$\langle \text{TiSe} \rangle$	-14.65 $\pm$ 0.3	854	24.5 $\pm$ 0.6	854
$\langle \text{Ti}_2\text{Te} \rangle^\dagger$	-19.2 $\pm$ 2.8	854	41.6 $\pm$ 2.6	854
$\langle \text{Tm} \rangle$	0	—	(17.7)	99
$\langle \text{TmCl}_3 \rangle$	-235.8 $\pm$ 2.5	918	35.1	—
$\langle \text{U} \rangle$	0	—	12.02 $\pm$ 0.1	99
$\langle \text{U} \rangle$	125.0 $\pm$ 2.0	99	47.72	99
$\langle \text{UH}_3 \rangle^\S$	-30.4 $\pm$ 0.2	399	15.2 $\pm$ 0.1	399
$\langle \text{UF}_3 \rangle$	-357.1 $\pm$ 1.2	797	28.0 $\pm$ 2.0	—
$\langle \text{UF}_4 \rangle$	-453.7 $\pm$ 1.2	797	36.3 $\pm$ 0.1	399
$\langle \text{UF}_5 \rangle$	-491.5 $\pm$ 0.6	399	45.0 $\pm$ 3.0	399
$\langle \text{UF}_6 \rangle$	-522.4 $\pm$ 0.4	—	54.4 $\pm$ 0.5	399
$\langle \text{UF}_6 \rangle$	-510.7 $\pm$ 0.5	399	90.4 $\pm$ 0.5	399
$\langle \text{UCl}_3 \rangle$	-213.5 $\pm$ 2.0	399	38.0 $\pm$ 0.2	399

standard entropies and structures (contd.)

tr.pt. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	Sb	1037	—	—
—	Sb	285	—	—
—	—	—	—	—
—	Sb	1308	CdI ₂	—
-53	Sb	831	—	—
—	—	—	—	—
—	-24	136	—	—
—	—	—	—	—
—	38	232	SnI ₄	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	106	155	SnI ₄	—
—	—	—	—	—
—	920	—	—	—
991	2020	—	NaCl	—
200	1842	—	Cr ₂ O ₃	—
180	1780	—	monoclinic	—
—	1860	—	Table Aa	—
—	1930	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	2950	—	NaCl	† TiN _{0.42-1.0}
—	3150	—	NaCl	† TiC _{0.6-11.0}
—	3225	—	—	—
—	(1460)	—	AuCu	§ TiAl _{0.38-1.4}
—	(1340)	—	tetragonal	—
234	304	1473	Mg	—
—	—	—	—	—
83	322	—	—	—
—	—	—	—	—
—	431	820	CsCl	—
—	—	—	—	—
—	460	825	CsCl	—
178	442	833	CsCl	—
—	579	—	Cu ₂ O	—
—	834	—	Sc ₂ O ₃	—
—	457	—	CdI ₂ , def.	—
430	632	—	K ₂ SO ₄	—
—	390	—	—	—
—	330	—	—	—
—	453	—	—	—
—	—	—	—	—
1510	1545	1950	—	—
—	845	—	—	—
668, 775	1132	4135	orthorhomb.	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	1036	—	cubic	—
—	—	—	CeF ₄	—
—	—	—	ThF ₄	—
—	—	—	tetragonal	—
—	Sb	57	—	—
—	—	—	—	—
—	836	(1660)	hexagonal	—

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	590	789	ThCl	
—	—	—	—	
—	—	—	hexagonal	
—	727	—	UCl ₃	
—	519	777	—	
—	—	—	PuBr ₃	
—	506	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	2830	—	CaF ₂	† UO _{2-0-2.24} (1100°C)
—	—	—	cubic	
—	—	—	orthorhomb.	‡ UO _{2-61-2.67}
—	—	—	hexagonal	
—	—	—	—	
—	2460	—	—	
—	2030	—	—	
1350	1850	—	—	
—	—	—	—	
—	2850	—	NaCl	
—	—	—	Sc ₂ O ₃	
—	[1450]	—	NaCl	
—	[1150]	—	Th ₃ P ₄	
—	[1010]	—	Cu ₂ Sb	
—	2100	—	—	
—	—	—	—	
1825	2180	—	CaC ₂	
—	—	—	—	
—	1665	—	tetragonal.	
—	—	—	orthorhomb.	
—	—	—	—	
—	1700	—	TiB ₂	
—	1510	—	AuCu ₃	
—	—	—	—	
—	—	—	—	
—	—	—	—	
—	—	—	AuCu ₃	
—	—	—	—	
—	2260	—	—	
—	—	—	—	
—	—	—	C _{Te} Al ₂	
—	—	—	AuCu ₃	
—	—	—	orthorhomb.	
—	—	—	—	
—	1200	—	—	
—	[1850]	—	—	
—	—	—	—	
—	1902	3350	Na	
—	—	—	—	
—	—	—	—	

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{VF}_4 \rangle$	-335.4 ± 5.0	918	29.0 ± 2.7	—
$\langle \text{VF}_5 \rangle$	-342.7 ± 5.0	918	76.67 ± 0.1	918
$\langle \text{VCl}_3 \rangle$	-134.0 ± 3.5	505	31.3 ± 0.3	828
$\langle \text{VCl}_4 \rangle$	-136.2 ± 0.8	505	61.53 ± 0.5	—
$\langle \text{VCl}_4 \rangle$	-126.8 ± 1.0	—	84.0 ± 2.5	—
$\langle \text{VBr}_2 \rangle$	-38.0 ± 6.0	617	30.0 ± 3.0	617
$\langle \text{VBr}_3 \rangle$	-107.0 ± 6.0	617	34.0 ± 3.0	617
$\langle \text{VBr}_4 \rangle$	-94.0 ± 5.0	617	80.0 ± 3.0	617
$\langle \text{VI}_2 \rangle$	-63.0 ± 5.0	631	35.0 ± 3.0	631
$\langle \text{VI}_3 \rangle$	-67.0 ± 4.0	631	48.5 ± 3.0	631
$\langle \text{VO} \rangle$	-103.2 ± 1.5	817 (1975)	9.32 ± 0.2	244
$\langle \text{V}_2\text{O}_3 \rangle$	-291.3 ± 1.5	817 (1975)	23.44 ± 0.3	817 (1975)
$\langle \text{VO}_2 \rangle$	-170.5 ± 0.9	817 (1975)	12.37 ± 0.2	817 (1975)
$\langle \text{V}_2\text{O}_5 \rangle$	-370.6 ± 1.5	817 (1975)	31.2 ± 0.4	817 (1975)
$\langle \text{VN}_{0.465} \rangle$	-31.6 ± 1.5	817 (1975)	6.38 ± 0.04	817 (1975)
$\langle \text{VN} \rangle$	-51.9 ± 2.5	310	8.91 ± 0.1	125
$\langle \text{VC}_{0.88} \rangle$	-24.35 ± 0.5	Mah	6.61 ± 0.08	Mah
$\langle \text{VC} \rangle^\dagger$	-24.1 ± 0.8	—	6.6 ± 0.12	—
$\langle \text{V}_3\text{Si} \rangle$	-36.0 ± 7.5	840	24.25 ± 2.7	—
$\langle \text{V}_5\text{Si}_4 \rangle$	-110.5 ± 18.0	840	49.9 ± 3.0	—
$\langle \text{VSi}_2 \rangle$	-30.0 ± 9.0	840	14.0 ± 1.2	840
$\langle \text{W} \rangle$	0	—	7.8 ± 0.1	99
$\langle \text{W} \rangle$	+203.0 ± 3.0	99	41.55	99
$\langle \text{WF}_6 \rangle$	-411.5 ± 0.6	817	81.5	817
$\langle \text{WCl}_5 \rangle$	-122.6 ± 9.0	817	52.0	817
$\langle \text{WCl}_5 \rangle$	-98.6 ± 8.0	817	69.9	817
$\langle \text{WCl}_6 \rangle$	-117.6 ± 6.0	817	100.2	817
$\langle \text{WOF}_4 \rangle$	-333.3 ± 15.0	817 (1975)	42.0 ± 2.0	817 (1975)
$\langle \text{WOF}_4 \rangle$	-319.5 ± 15.0	817 (1975)	80.0 ± 2.0	817 (1975)
$\langle \text{WO}_2\text{I}_2 \rangle$	-102.8 ± 2.5	799	90.1 ± 2.0	799
$\langle \text{WO}_2 \rangle$	-140.95 ± 1.5	546, 22	12.08 ± 0.4	817
$\langle \text{WO}_3 \rangle$	-201.45 ± 0.7	564, 22	18.14 ± 0.3	817
$\langle \text{WS}_2 \rangle$	-48.44 ± 4.0	307	20.0 ± 3.0	307
$\langle \text{W}_2\text{Si}_3 \rangle$	-32.3 ± 5.0	840	54.9 ± 3.3	840
$\langle \text{WSi}_2 \rangle$	-22.2 ± 2.2	840	15.3 ± 1.2	840
$\langle \text{W}_2\text{C} \rangle$	-6.3 ± 0.6	—	—	—
$\langle \text{WC} \rangle^\dagger$	-9.1 ± 2.5	772	10.0 ± 1.0	655
$\langle \text{W(CO)}_6 \rangle$	-226.3 ± 2.0	358, 416	—	—
$\langle \text{Y} \rangle$	0	—	10.63 ± 0.1	703
$\langle \text{Y} \rangle$	101.5 ± 2.0	339	42.87	790
$\langle \text{YF}_3 \rangle$	-410.7 ± 3.5	202	26.2 ± 1.5	—
$\langle \text{YCl}_3 \rangle$	-232.7 ± 1.0	332	(32.7)	332
$\langle \text{YI}_3 \rangle$	-147.7 ± 7.5	918	(49.5)	—
$\langle \text{Y}_2\text{O}_3 \rangle$	-455.4 ± 1.5	371	23.7 ± 0.1	—
$\langle \text{YN} \rangle$	-71.5 ± 5.0	176	9.0 ± 1.2	—
$\langle \text{YRe}_2 \rangle$	-32.45 ± 1.2	884	26.3 ± 1.0	884
$\langle \text{Yb} \rangle$	0	—	14.3 ± 0.06	99
$\langle \text{YbCl}_2 \rangle$	-191.1 ± 2.1	NBS 270	31.2 ± 1.5	—
$\langle \text{YbCl}_3 \rangle$	-229.4 ± 1.8	734	35.3 ± 2.8	—
$\langle \text{Yb}_2\text{O}_3 \rangle$	-433.7 ± 1.5	371	31.8 ± 0.1	—
$\langle \text{Zn} \rangle$	0	—	9.95 ± 0.05	125
$\langle \text{Zn} \rangle$	+31.17	176	38.45	991
$\langle \text{ZnF}_2 \rangle$	-182.7 ± 0.5	402	17.6 ± 0.1	415
$\langle \text{ZnCl}_2 \rangle$	-99.2 ± 0.25	907	26.64 ± 0.1	907

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	—	—	—	—
—	—	—	—	—
—	—	—	AsI ₃	—
—	-26	160	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	1790	—	f.c.c.	—
—	2070	—	Cr ₂ O ₃	—
67	1545	—	monoclinic	—
—	670	[1690]	orthorhomb.	—
—	[2600]	—	—	—
—	2350	—	NaCl	—
—	[2345]	—	NaCl	—
—	—	—	—	† hypothetical
—	1935	—	—	—
—	2010	—	—	—
—	1680	—	—	—
—	3410	5555	Na	—
—	—	—	—	—
—	3	17	—	—
—	253	288	—	—
—	—	—	—	—
230	282	—	rhombohed.	—
—	106	—	—	—
—	—	—	—	—
—	—	—	—	—
—	[1724]	—	monoclinic	—
777	1472	1837	monoclinic	—
—	—	—	MoSi ₂	—
—	—	—	—	—
—	2150	—	MoSi ₂	—
—	—	—	—	—
—	—	—	hexagonal	† WC _{0.98-1.01} (2500°C)
—	—	—	—	—
1480	1526	3340	Mg	—
—	—	—	—	—
1077	1155	—	—	—
—	721	(1510)	—	—
—	—	—	—	—
1057	2704	(4300)	Sc ₂ O ₃	—
—	> 2670	—	NaCl	—
—	—	—	—	—
760	824	1194	—	—
—	—	—	—	—
—	854	—	—	—
—	2439	—	Sc ₂ O ₃	—
—	—	—	—	—
—	420	907	Mg	—
—	—	—	—	—
—	950	1505	rutile	—
—	317	732	CdCl ₂	—

Table A. Heats of formation.

Substance	ΔH_{298}° (kcal/mole)	Ref.	S_{298}° (cal/deg mole)	Ref.
$\langle \text{ZnBr}_2 \rangle$	-78.8 ± 0.6	907	32.5 ± 1.0	907
$\langle \text{ZnI}_2 \rangle$	-49.75 ± 0.2	907	38.6 ± 1.0	907
$\langle \text{ZnO} \rangle$	-83.8 ± 0.1	907	10.43 ± 0.1	907
$\langle \text{ZnS} \rangle$	-49.05 ± 0.7	907	13.78 ± 0.1	907
$\langle \text{ZnS} \rangle$	+48.67 ± 3.2	907	57.0 ± 0.4	907
$\langle \text{ZnSO}_4 \rangle$	-234.55 ± 0.4	907	26.42 ± 0.1	907
$\langle \text{ZnSe} \rangle$	-38.0 ± 2.0	854	16.8 ± 1.0	854
$\langle \text{ZnSeO}_3 \rangle$	-155.9 ± 0.75	907	23.5 ± 2.0	907
$\langle \text{ZnTe} \rangle$	-28.5 ± 0.2	99	18.68 ± 0.4	99
$\langle \text{Zn}_3\text{N}_2 \rangle$	-5.3 ± 2.0	264	33.5 ± 2.8	—
$\langle \text{Zn}_3\text{As}_2 \rangle$	-32.2 ± 2.5	898	39.4 ± 2.9	898
$\langle \text{Zn}_3\text{P}_2 \rangle$	-38.0 ± 3.5	821	36.0 ± 2.5	821
$\langle \text{Zn}_3\text{P}_2 \rangle$	-24.3 ± 3.0	821	14.4 ± 4.5	821
$\langle \text{ZnSb} \rangle$	-4.55 ± 0.3	99	19.75 ± 0.4	99
$\langle \text{ZnCO}_3 \rangle$	-195.5 ± 0.3	907	19.7 ± 0.3	125
$\langle \text{Zn}_2\text{SiO}_4 \rangle$	-7.8 ± 0.5*	840	31.4 ± 0.3	243
$\langle \text{Zn}_2\text{TiO}_4 \rangle$	-0.8 ± 0.5*	816	35.4 ± 0.4	816
$\langle \text{ZnTiO}_3 \rangle$	-1.6 ± 0.4*	816	22.7 ± 0.4	816
$\langle \text{ZnFeO}_4 \rangle$	-1.2 ± 1.0*	840	36.64 ± 0.1	907
$\langle \text{ZnWO}_4 \rangle$	-10.0 ± 0.5*	840	34.5 ± 2.5	840
$\langle \text{ZnAl}_2\text{O}_4 \rangle$	-10.75 ± 0.4*	815	20.8 ± 0.5	815
$\langle \text{ZnCr}_2\text{O}_4 \rangle$	-15.0 ± 0.3*	815	27.8 ± 0.3	815
$\langle \text{Zr} \rangle$	0	—	9.32 ± 0.05	—
$\langle \text{Zr} \rangle$	143.67 ± 2.0	—	43.32 ± 1.0	—
$\langle \text{ZrF}_2 \rangle$	-140.0 ± 10.0	—	—	—
$\langle \text{ZrF}_3 \rangle$	-265.0 ± 10.0	—	—	—
$\langle \text{ZrF}_4 \rangle$	-456.8 ± 0.5	—	25.0 ± 0.1	—
$\langle \text{ZrO} \rangle$	20.0 ± 10.0	—	—	—
$\langle \text{ZrCl}_4 \rangle$	-234.4 ± 0.3	—	43.5 ± 0.6	—
$\langle \text{ZrCl}_4 \rangle$	-207.9 ± 1.0	—	88.0 ± 1.0	—
$\langle \text{ZrBr}_4 \rangle$	-181.6 ± 1.0	—	—	—
$\langle \text{ZrBr}_4 \rangle$	-155.0 ± 2.0	—	—	—
$\langle \text{ZrI}_4 \rangle$	-115.9 ± 1.0	—	—	—
$\langle \text{ZrO}_2 \rangle$	-263.1 ± 0.5	—	12.12(±0.4)	—
$\langle \text{ZrF}_4 \rangle$	-400.1 ± 1.0	—	76.0 ± 1.0	—
$\langle \text{ZrN} \rangle$	-88.0 ± 0.6	—	9.29 ± 0.3	—
$\langle \text{ZrC}_{0.96} \rangle$	-48.27 ± 0.6	—	7.93 ± 0.5	—
$\langle \text{Zr}_2\text{Si} \rangle$	-81.0 ± 3.0	—	—	—
$\langle \text{Zr}_3\text{Si}_3 \rangle$	-146.7	—	—	—
$\langle \text{Zr}_6\text{Si}_5 \rangle$	-203.3	—	—	—
$\langle \text{ZrSi} \rangle$	-35.3	—	—	—
$\langle \text{ZrSi}_{1.62} \rangle$	-35.8	—	—	—
$\langle \text{ZrSiO}_4 \rangle$	-486.4 ± 2.0	—	20.2	—
$\langle \text{ZrB}_2 \rangle$	-77.4 ± 1.5	—	8.59	—
$\langle \text{ZrH}_2 \rangle$	-40.5(±0.5)	—	8.40	—
$\langle \text{ZrD}_2 \rangle$	-41.82 ± 0.5	—	9.18	—

standard entropies and structures (contd.)

tr.pts. (°C)	m.pt. (°C)	b.pt. (°C)	Structure	Remarks
—	402	670	orthorhomb.	
—	442	—	—	
—	1975	—	wurtzite	
1175	1775	—	Table Aa	
—	—	—	—	
+	—	—	—	
—	1525	—	ZnS	
—	621	—	—	
—	1290	—	ZnS	
—	—	—	Sc ₂ O ₃	
190, 646, 692	945	—	—	
—	—	—	—	
—	980	—	—	
—	548	—	CdSb	
—	—	—	M ₂ CO ₃	
—	1512	—	BeSiO ₄	*from oxides
—	1549	—	spinel	*from oxides TiO ₂ (Rut). ZnO
—	decomp.	—	—	*from oxides
—	1590	—	—	*from oxides
—	—	—	—	*from oxides
—	—	—	—	*from oxides ZnO, Al ₂ O ₃ (α)
—	—	—	—	*from oxides
—	1857	4305	Mg	
—	—	—	—	
—	—	—	—	
—	932	sub 904	ThF ₄	
—	—	—	—	
—	437	sub 335	SnI ₄	
—	—	—	—	
—	450	sub 360	—	
—	—	—	—	
—	499	sub 428	—	
1175, 2295	2680	—	monoclinic	
—	—	—	—	
—	2950	—	NaCl	
—	3420	—	CuAl ₂	
—	2110	—	CuAl ₂	
—	2150	—	Ti ₅ Si ₃	
—	—	—	—	
—	2090	—	hexagonal	
—	2430	—	—	
—	—	—	tetragonal	
—	3200	—	—	
—	sub	908	—	
—	—	—	—	

Table Aa. Structures

Substance	Description	Atoms or molecules per cell	Coordination	Remarks
<i>Elements</i>				
Ag	cubic face centred	4A	12	metallic lattice
As	rhombohedral	2A	3	homop. layers
diamond	cubic	8A	4	homop. lattice
graphite	Widely separated layers 	4A	3	homop. layers
Ga	orthorhombic	8A	1 + 2 + 2 + 2	homop.—metallic
Hg	rhombohedral, dist. face centred cubic	1A	6 + 6	metallic (+ homop.)
I	orthorhombic, similar to Ga	8A	1	I ₂ molecules
In	tetragonal, dist. face centred cubic	2A	4 + 8	metallic (+ homop.)
Mg	hexagonal close packed	2A	12	metallic
α -Mn	cubic, dist. body centred	58A	12 - 16	
Na	cubic body centred	2A	8	metallic
S	rhombic	128A	2	S ₈ molecules
S	monoclinic	48A	2	homop. chains
Se	hexagonal	3A	2	homop. chains
Sn, white	tetragonal, dist. diamond str.	4A	6	homop.—metallic
U	orthorhombic, dist. Mg str.	4A	12	metallic
<i>AB-types</i>				
CsCl	cubic body centred	1M	K8l, A8l	hetp. (+ metallic)
NaCl	simple cubic	4M	K6l, A6l	hetp. to homop.
NaTi	{ superlattice of CsCl, Na and Ti form separate diamond str.	8M	K4l, A4l	{ hetp., homop. and { metallic, mixed { Ni atoms form { chains C.N.2 (homop.) (homop.)
NiAs	hexagonal	2M	K6l, A6l	
PdO	tetragonal, similar to SnO	2M	K4l, A4l	
SnO	tetragonal	2M	K4l, A4l	
ZnS blende*	cubic face centred	4M	K4l, A4l	ionic
ZnS wurtzite	hexagonal	2M	K4l, A4l	ionic
<i>AB₂-types</i>				
CaC ₂	tetragonal	2M	{ Ca(4-2)l, { C(4-2)l	
CaF ₂	cubic	4M	K8l, A4l	ionic
CdCl ₂	rhombohedral	1M	K6n, A3n	layer lattice
CdI ₂	hexagonal	1M	K6n, A3n	layer lattice
Co ₂ P	Co hexagonal cl. p., P interstitial			
Cu ₂ O	cubic	2M	K2l, A4l	
Fe ₂ P	hexagonal	3M	complicated	
FeS ₂ pyrites	cubic	4M	K6l, A6l	
marcasite	orthorhombic	2M	Fe6l, S6l	{ Fe atoms forming chains, S atoms forming S ₂ islands { C.N. of I atoms app. 12, ionic, layer lattice
HgI ₂ red	tetragonal	2M	Hg4l, I2l	
HgCl ₂	orthorhombic	4M	Hg2l, Cl1	molecular layer str.
MgCu ₂ (CeAl ₂)	cubic	8M	Mg12l, Cu6l	metallic
MgNi ₂	hexagonal	8M	Mg12l, Ni6	metallic
MgZn ₂	hexagonal cl. p.	4M	Mg12l, Zn6l	metallic

*quoted as ZnS in Table A.

Table Aa. Structures (contd.)

Substance	Description	Atoms or molecules per cell	Coordination	Remarks
MoS ₂	hexagonal	2M	Mo6l, S3l	layer lattice of Mo
PbCl ₂	orthorhombic	4M	{ Pb(3 + 1)l, { Cl(2 or 1)	
α , β -quartz	hexagonal	3M	Si4l, O2l	
β -cristobalite	cubic	8M	Si4l, O2l	
β -tridymite	hexagonal, similar to quartz	4M	Si4l, O2l	
TiO ₂ rutile	tetragonal	2M	Ti6l, O3l	Ti chains O:C.N.11
<i>A₂B₃-types</i>				
As ₂ O ₃	cubic	16M	As3, O2	As ₄ O ₆ molecules
Cr ₂ O ₃	rhombohedral	2M	Cr6l, O4l	ionic, O:cl.p.
La ₂ O ₃	hexagonal	1M	{ La(4 + 3)l, { O(2 + 2)l	ionic (+ metallic)
Sc ₂ O ₃	cubic, dist. CaF ₂	16M	Sc6l, O4l	ionic, Sc:C.N.12
<i>AB₃-types</i>				
AlF ₃	rhombohedral { similar	2M	K6l, A2l	ionic, C.N:F(8 + 2)
AsI ₃	rhombohedral {	2M	K6l, A2l	ionic, C.N.F(8 + 2)
BiF ₃	cubic	4M	K8l, A4l	ionic, Bi:C.N.12 F:C.N. 4 or 8
Co ₃ N	Co hexagonal cl.p., N interstitial			
MoO ₃	orthorhombic	4M	Mo6l, O1, 2 or 3	O:C.N.12
ReO ₃	cubic	1M	Re6l, O2l	ionic
SnI ₄	cubic	8M	Sn4l, I1	Sn ₄ molecules

Table B. Heats and temperatures of transformation

Substance	θ_i (°C)	λ_i (kcal/mole)	Ref.	θ_f (°C)	λ_f (kcal—mole)	Ref.
Ag	—	—	—	960.8	2.65 ± 0.1	147
AgCl	—	—	—	455	3.1 ± 0.1	124
AgBr	—	—	—	(430)	2.2 ± 0.4	124
AgI	147	(1.47)	124	558	2.25 ± 0.5	124
Ag ₂ S	176; 586	1.4 ± 0.4; —	192	830	2.7 ± 0.5	307
Ag ₂ SO ₄	430	3.75	364	660	(4.3)	364
Ag ₂ Se	133	2.19 ± 0.1	—	—	—	907
AgNO ₃	160	0.6	124	210	2.75 ± 0.2	124
AgCd	211; 443	—; 0.46 ± 0.2	264	—	—	—
AgCd ₂	—	—	—	[578]	6.05 ± 0.3	264
Al	—	—	—	659	2.5 ± 0.03	147
AlF ₃	454	0.15	314	—	—	—
Al ₂ Cl ₆	—	—	—	<193>	17.0 ± 0.6	124
Al ₂ Br ₆	—	—	—	97	5.4 ± 0.3	124
Al ₂ I ₆	—	—	—	191	8.0 ± 0.6	124
Al ₂ O ₃	—	—	—	2051	25.7	938
AlSb	—	—	—	1060	19.6 ± 0.5	907
AsF ₃	—	—	—	—6	2.49 ± 0.03	125
AsF ₅	—	—	—	—80	2.7 ± 0.4	198
AsCl ₃	—	—	—	—16	2.4 ± 0.4	121
AsBr ₃	—	—	—	31	2.8 ± 0.3	198
AsI ₃	—	—	—	142	2.2 ± 0.6	25
As ₄ O ₆	—33	1.35 ± 0.2	380	309	8.8 ± 1.0	198
As ₂ S ₃	177	0.07	—	312	6.85	854
As ₂ Se ₃	—	—	—	377	9.75 ± 1.0	854
As ₂ Te ₃	—	—	—	375	11.2 ± 1.0	854
Au	—	—	—	1063	3.05 ± 0.1	147
AuSn	—	—	—	418	6.12 ± 0.2	264
AuPb ₂	—	—	—	[254]	5.7 ± 0.4	124
AuCd	267 (o—d)	0.24	264	627	4.3 ± 0.2	264
B	—	—	—	2180	5.4	817
BF ₃	—131	0.018	125	—129	1.014	125
B ₂ O ₃	—	—	—	450	5.3 ± 0.3	198
B ₂ S ₃	—	—	—	563	11.5	854
Ba	370	0.15 ± 0.08	147	729	1.83 ± 0.1	147
BaF ₂	—	—	—	1290	6.8 ± 1.0	394
BaCl ₂	922	4.1	474	962	4.0 ± 0.1	531
BaBr ₂	—	—	—	854	7.5 ± 0.2	474
BaI ₂	—	—	—	712	6.35 ± 0.1	474
BaO	—	—	—	1925	1.38 ± 2.0	—
Ba(OH) ₂	—	—	—	408	3.4 ± 0.2	198
BaSO ₄	1150	—	—	1350	9.7 ± 0.8	121
BaCO ₃	806; 968	4.5; 0.7	154	dec.	—	—
BaTiO ₃	5; 120	0.016; 0.047	14	1760	—	—
Be	1254	0.61	—	1287	2.92	755
BeF ₂	227	0.053	—	552	1.135	755
BeCl ₂	403	1.63 ± 0.15	—	415	2.07 ± 0.06	755
BeBr ₂	—	—	—	488	(4.5)	25
BeI ₂	—	—	—	480	5.0	755
BeO	—	—	—	2580	19.3 ± 1.0	755
BeSO ₄	590, 635	0.266; 4.67	—	—	—	755

Table B. Heats and temperatures of transformation (contd.)

Substance	θ_i (°C)	λ_i (kcal/mole)	Ref.	θ_f (°C)	λ_f (kcal—mole)	Ref.
Bi	—	—	—	271.3	2.6 ± 0.05	147
BiCl ₃	—	—	—	233	5.7 ± 0.2	—
BiBr ₃	—	—	—	218	5.2 ± 0.2	—
BiI ₃	—	—	—	409	9.35	924
Bi ₂ O ₃	705	13.6 ± 3.0	—	824	14.3	933
Bi ₂ S ₃	—	—	—	767	18.7	—
Bi ₂ Te ₃	—	—	—	587	28.8 ± 0.6	443, 523
Bi ₃ Tl ₂	—	—	—	213	8.7 ± 0.5	264
Br ₂	—	—	—	—7.3	2.52 ± 0.1	23
C	—	—	—	3800	25 ± 2*	447
CCl ₄	—48	1.1 ± 0.05	125	—23	0.60 ± 0.02	125
CBr ₄	47	1.6 ± 0.05	387	90	0.95 ± 0.05	25
COCl ₂	—	—	—	—128	1.37 ± 0.05	125
CS ₂	—	—	—	—112	1.05 ± 0.1	125
COS	—	—	—	—139	1.13 ± 0.1	125
Ca	464	0.06	—	843	2.0 ± 0.1	147
CaF ₂	1151	1.14 ± 0.2	125	1418	7.1 ± 0.1	125
CaCl ₂	—	—	—	772	6.8 ± 0.1	125
CaBr ₂	—	—	—	742	6.9 ± 0.1	531
CaO	—	—	—	2615	(19.0)	—
CaSO ₄	1193	—	—	—	(6.7)	121
Ca ₂ P ₂ O ₇	1140	1.6 ± 0.2	55	1353	24.1 ± 0.5	55
CaC ₂	447	1.33 ± 0.2	124	2300	—	—
CaCO ₃	50*	0.045 ± 0.02	126	dec.	—	—
CaTiSiO ₅	—	—	—	1400	29.6 ± 1.0	305
CaSiO ₃	1190	(1.3)	—	1540	(13.4)§	121
Ca ₂ SiO ₄	675; 1420	1.06; 0.78	262	2130	—	—
CaTiO ₃	1260	(0.55)	198	—	—	—
CaO·2B ₂ O ₃	—	—	—	990	27.1 ± 0.4	124
CaO·B ₂ O ₃	—	—	—	1160	17.7 ± 0.4	124
2CaO·B ₂ O ₃	531	1.1 ± 0.2	124	1310	24.1 ± 0.4	124
3CaO·B ₂ O ₃	—	—	—	1490	35.5 ± 0.6	124
Ca ₂ Fe ₂ O ₃	—	—	—	[1480]	36.1 ± 1.2	348
CaFe ₂ O ₄	—	—	—	[1240]	25.9 ± 1.0	348
Ca ₃ P ₂ O ₈	1100	3.7 ± 0.3	124	—	—	—
CaMgSi ₂ O ₆	—	—	—	1392	30.7	902
CaAl ₂ Si ₂ O ₈	—	—	—	1553	39.9	902
CaUO ₄	752	0.22	931	—	—	—
Cd	—	—	—	321	1.53 ± 0.04	147
CdCl ₂	—	—	—	568	7.2 ± 0.2	632
CdBr ₂	—	—	—	567	8.0 ± 0.2	632
CdI ₂	—	—	—	390	4.95 ± 0.3	632
CdSb	—	—	—	456	7.7 ± 0.3	264
CdSeO ₃	—	—	—	680	14.0 ± 2.0	907
Ce	725	0.7	99	795	1.25 ± 0.3	99
CeF ₃	—	—	—	1437	13.5 ± 2.5	932
CeCl ₃	—	—	—	817	12.8 ± 0.4	927
CeBr ₃	—	—	—	732	12.4 ± 0.4	927
CeI ₃	—	—	—	760	12.2	927
Cl ₂	—	—	—	—101	1.53 ± 0.08	125

* at 48 Kbar

Table B. Heats and temperatures of transformation (contd.)

Substance	θ_i (°C)	λ_i (kcal/mole)	Ref.	θ_f (°C)	λ_f (kcal—mole)	Ref.
Co	430	0.11	—	1495	3.70 ± 0.1	99
CoCl ₂	—	—	—	740	14.1 ± 3.0	208
Co ₂ Si	—	—	769	1330	16.5 ± 1.5	264
CoSi	—	—	769	1460	16.54	—
CoSi ₂	—	—	—	1327	23.9	—
CoWO ₄	713	0.445	—	940	—	—
Cr	—	—	—	1857	5.0 ± 0.6	—
CrCl ₂	—	—	—	815	7.7 ± 1.5	198
CrO ₃	—	—	—	198	3.4 ± 0.3	935
Cr ₂ Si ₃	—	—	—	1647	64.25	769
CrSi ₂	—	—	—	1457	30.55	769
Cs	—	—	—	29.8	0.50 ± 0.01	147
CsF	—	—	—	703	5.2 ± 0.2	—
CsCl	470	0.9	—	645	3.8	817
CsBr	—	—	—	635	5.65 ± 0.2	474
CsI	—	—	—	621	5.7 ± 0.2	474
Cu	—	—	—	1083	3.1 ± 0.1	147
CuBr	380; 465	1.4; 0.7	91	488	(2.3)	25
CuCl	407	1.45 ± 0.07	—	423	1.75 ± 0.1	939
CuI	—	—	—	588	(2.6)	25
CuF ₂	—	—	—	770	9.4	817
Cu ₂ O	—	—	—	1236	13.58	817
Cu ₂ S	103; 350	0.92; 0.20	124	1130	2.6 ± 0.5	190
Cu ₂ Se	122	1.63 ± 0.08	—	—	—	930
Cu ₂ Te	160, 258, 317, 360, 568	0.053; 0.455; 0.23; 0.585; 0.477	—	—	—	930
CuFeO ₂	818	0.09	—	1197	15.38	—
CuFe ₂ O ₄	402; 522	0.18	—	1085	—	—
DyCl ₃	—	—	—	651	6.1	927
ErCl ₃	—	—	—	776	7.8	927
Fe	(760); 914; 1391	1.22; 0.16; 0.2	—	1536	3.29 ± 0.1	925
FeCl ₂	—	—	—	677	10.3 ± 0.1	124
FeCl ₃	—	—	—	304	10.3	817
FeBr ₃	377	0.1	—	691	12.0	817
FeI ₂	375	0.2	—	590	10.7	817
Fe _{0.95} O	—	—	—	1378	7.4 ± 0.2	42, 45
Fe ₃ O ₄	—	—	—	1597	33.0 ± 2.0	198
Fe ₂ O ₃	(680); (780)	0.16; —	42	1594	—	—
FeS	138; 325	0.57; 0.12	41	1195	7.73 ± 0.2	41
Fe ₃ C	190	0.18	124	1227	12.3 ± 1.0	124
Fe(CO) ₅	—	—	—	—20	3.15 ± 0.1	559
Fe ₂ SiO ₄	—	—	—	1220	22.0 ± 1.0	181
FeTiO ₃	—	—	—	1470	21.7 ± 0.5	124
Ga	—	—	—	29.8	1.336 ± 0.01	147
GaBr ₃	—	—	—	122	(2.8)	—
GaCl ₃	—	—	—	78	2.75	907
GaI ₃	—	—	—	212	(3.9)	—
GdCl ₃	—	—	—	602	9.7	927
GdI ₃	740	0.14	—	930	12.9	927

Table B. Heats and temperatures of transformation (contd.)

Substance	θ_i (°C)	λ_i (kcal/mole)	Ref.	θ_f (°C)	λ_f (kcal—mole)	Ref.
Ge	—	—	—	940	8.8 ± 0.3	614
GeCl ₄	—	—	—	—49	—	—
GeBr ₄	—	—	—	26	2.9 ± 0.5	—
GeO ₂	1033	—	—	1116	10.5 ± 2.0	—
GeS	—	—	—	615	5.1 ± 1.5	622
HF	—	—	—	—83	0.94 ± 0.01	—
H ₂ O	—	—	—	0	1.436 ± 0.003	125
H ₂ O ₂	—	—	—	—0.5	2.92 ± 0.1	64
H ₂ S	—170; —147	0.37; 0.11	125	—85.5	0.586 ± 0.01	125
H ₂ S ₂	—	—	—	—90	1.8 ± 0.3	198
H ₂ Se	—191; —101	0.31; 0.27	198	—66	0.60	198
H ₂ Te	—	—	—	—49	(1.6)	—
Hf	1750	(1.65)	—	2230	(5.75)	—
HfO ₂	1700	2.5	—	2810	25.0	—
Hg	—	—	—	—39	0.55 ± 0.005	30, 147
HgCl ₂	—	—	—	278	4.65 ± 0.1	632
HgBr ₂	—	—	—	238	4.3 ± 0.1	713
HgF ₂	—	—	—	645	5.5	817
HgI ₂	130	0.65 ± 0.1	124	250	4.5 ± 0.5	25
HgS	345	1.0	198	825	—	—
HoF ₃	1070	—	—	1143	13.46 ± 0.15	937
HoCl ₃	—	—	—	720	7.3	927
I ₂	—	—	—	114	3.77 ± 0.08	124
In	—	—	—	157	0.78 ± 0.02	147
InCl	120	1.65	—	225	2.2	907
InBr	—	—	—	275	5.8	907
InI	—	—	—	365	5.35 ± 1.1	907
In ₂ S ₃	390; 830	0.26; 0.96	—	—	—	854
InTe	—	—	—	695	8.6 ± 0.2	907
In ₂ Te ₃	—	—	—	670	19.5 ± 0.3	907
InP	637	0.09	—	1055	15.0 ± 2.5	907
InAs	—	—	—	942	18.4 ± 2.0	748
InSb	—	—	—	525	11.8	748
Ir	—	—	—	2454	(6.3)	—
IrF ₆	0.4	—	1.7	44	(1.2)	25
K	—	—	—	63.5	0.571 ± 0.005	147
KF	—	—	—	857	6.75 ± 0.3	124
KCl	—	—	—	772	6.35 ± 0.1	474
KBr	—	—	—	740	6.1 ± 0.1	474
KI	—	—	—	685	5.75 ± 0.1	474
KOH	249	1.51	—	400	2.24 ± 0.3	817
K ₂ CO ₃	—	—	—	901	6.6	817
K ₂ SO ₄	583	2.14 ± 0.2	124	1069	8.8 ± 0.2	364
La	868	0.68	—	920	2.03 ± 0.3	—
LaCl ₃	—	—	—	855	13.0 ± 0.2	474
LaBr ₃	—	—	—	783	13.0 ± 1.0	474
LaF ₃	—	—	—	1493	12.0 ± 0.2	937
LaI ₃	—	—	—	778	13.4	927
Li	—	—	—	180.5	0.70 ± 0.03	147, 290

Table B. Heats and temperatures of transformation (contd.)

Substance	θ_i (°C)	λ_i (kcal/mole)	Ref.	θ_f (°C)	λ_f (kcal—mole)	Ref.
LiF	—	—	—	848	6.4 ± 0.15	288
LiCl	—	—	—	610	4.75 ± 0.1	474
LiBr	—	—	—	550	4.22 ± 0.2	474
LiI	—	—	—	469	3.5 ± 0.1	474
LiOH	—	—	—	473	5.0 ± 0.1	326
Li ₂ SO ₄	575	6.8	364	859	(3.05)	364
LiH	—	—	—	689	5.4	817
Li ₂ O	—	—	—	1570	14.0	902
Li ₂ CO ₃	350; 410	0.134; 0.535	—	720	10.7	817
Li ₂ Si ₂ O ₅	936	0.225	—	1034	12.86	817
LiBO ₂	—	—	—	844	8.09	817
Li ₃ AlF ₆	475; 575; 705	0.5; 0.3; 0.1	—	785	20.6	817
Li ₃ BeF ₄	—	—	—	472	10.6	755
Mg	—	—	—	650	2.1 ± 0.1	147
MgF ₂	—	—	—	1263	13.9 ± 0.2	124
MgCl ₂	—	—	—	714	10.3 ± 0.3	124
MgBr ₂	—	—	—	710	(8.3)	121
MgO	—	—	—	2825	18.5	817
MgSO ₄	—	—	—	1130	(3.5)	121
Mg ₃ N ₂	550; 788	0.11; 0.22	124	dec.	—	—
Mg ₃ (PO ₄) ₂	—	—	—	1348	29.0	817
Mg ₃ Sb ₂	930	—	—	1230	36.5 ± 4.0	—
Mg ₃ Bi ₂	700	—	—	823	25.5 ± 2.5	—
Mg ₂ Si	—	—	—	1100	20.5 ± 2.5	—
MgSiO ₃	630; 985	0.16; 0.39	—	1577	18.0 ± 5.0	817
Mg ₂ SiO ₄	—	—	—	1890	17.0 ± 5.0	817
Mg ₂ Sn	—	—	—	778	11.5 ± 1.0	145
Mg ₂ Pb	—	—	—	550	9.4 ± 0.5	264
MgTiO ₃	—	—	—	1840	21.6	817
MgZn ₂	—	—	—	590	10.2 ± 1.0	264
Mn	720; 1090; 1136	0.53; 0.53; 0.43	—	1244 ₁	3.5	99
MnF ₂	723 ₂	—	—	856	5.5	—
MnCl ₂	993	—	—	650	9.0 ± 0.2	124
MnO	—	—	—	1875	13.0 ± 1.5	—
Mn ₃ O ₄	1172	5.0 ± 0.3	124	1560	—	—
MnS	—	—	—	1530	6.25 ± 1.0	854
Mn ₃ C	1040	3.6 ± 0.3	124	—	—	—
Mn ₃ Si ₃	—	—	—	1300	41.4	769
MnSi	—	—	—	1275	14.2	769
Mn ₂ SiO ₄	—	—	—	1345	21.42	902
Mo	—	—	—	2620	8.5 ± 0.3	—
MoF ₆	-9	1.96	—	17.5	1.0 ± 0.1	449, 445
MoOF ₄	—	—	—	97	1.0 ± 0.1	449
MoCl ₅	—	—	—	194	(8.0)	25
MoO ₃	—	—	—	795	11.57	—
N ₂	-237.5	0.0547	125	-210	0.172	125
NH ₃	—	—	—	-78	1.352 ± 0.01	125
Na	—	—	—	97.8	0.63 ± 0.01	147
NaF	—	—	—	992	8.0 ± 0.1	314
NaCl	—	—	—	801	6.7 ± 0.1	474
NaBr	—	—	—	750	6.25 ± 0.1	474
NaI	—	—	—	660	5.65 ± 0.1	474

Table B. Heats and temperatures of transformation (contd.)

Substance	θ_i (°C)	λ_i (kcal/mole)	Ref.	θ_f (°C)	λ_f (kcal/mole)	Ref.
NaOH	293	1.52 ± 0.08	289	320	1.52 ± 0.08	289
Na ₂ O	750; 970	0.42; 2.85	—	1132	11.4	817
Na ₂ SO ₄	249; 707	2.58; 0.08	—	884	5.5	817
Na ₂ CO ₃	450	0.165	—	850	7.09	817
Na ₂ Si ₂ O ₅	678; 707	0.1; 0.15	817	874	8.5 ± 0.4	124
Na ₂ SiO ₃	—	—	—	1088	12.5 ± 0.3	124
Na ₂ TiO ₃	287	0.4 ± 0.1	124	1030	16.8 ± 0.4	124
Na ₂ Ti ₂ O ₅	—	—	—	985	26.2 ± 0.5	124
Na ₂ Ti ₃ O ₇	—	—	—	1128	37.1 ± 0.5	124
Na ₅ Pb ₂	—	—	—	400	12.0 ± 0.6	264
NaPb	—	—	—	368	3.9 ± 0.3	264
NaHg ₂	—	—	—	350	6.3 ± 0.4	264
Na ₂ WO ₄	588	(8.4)	198	695	(5.7)	121
Na ₄ SiO ₄	—	—	—	1120	13.8	902
NaBO ₂	—	—	—	966	8.66	817
Na ₃ AlF ₆	565; 880	1.97; 0.09	—	1012	25.64	817
Na ₂ CrO ₄	421	2.29 ± 0.15	—	797	5.79 ± 0.2	926
Na ₂ MoO ₄	445; 592; 642	5.2; 0.5; 1.98	—	689	5.12	926
Nb	—	—	—	2468	7.0 ± 1.0	—
NbF ₅	—	—	—	78	2.9 ± 0.1	445
NbCl ₅	—	—	—	205	6.9 ± 1.0	—
NbO ₂	820; 930	0.72	—	1902	15.0	—
Nb ₂ O ₅	—	—	—	1512	24.6	—
Nd	862	0.713	—	1024	1.705	99
NdF ₃	—	—	—	1377	13.08 ± 0.2	937
NdCl ₃	—	—	—	759	11.6	474
NdI ₃	574	3.3	—	787	9.9	927
NdBr ₃	—	—	—	684	10.8 ± 0.2	474
Ni	c. 358	0.14 ± 0.02	147	1455	4.1 ± 0.08	147
NiCl ₂	—	—	—	<1030>	18.5 ± 0.4	41
NiBr ₂	—	—	—	963	13.0 ± 2.5	—
Ni ₃ S ₂	550	—	—	790	(5.8)	121
Ni(CO) ₄	—	—	—	-25	3.3 ± 0.01	—
Ni ₂ Si	—	—	—	1318	12.0 ± 0.6	264
NiSi	—	—	—	992	10.6 ± 0.6	264
Ni ₃ Sn ₂	—	—	—	1264	27.6 ± 0.8	264
NiO·Fe ₂ O ₃	c. 582	0.85 ± 0.1	17	—	—	—
NpF ₆	—	—	—	54.4	4.2 ± 0.2	567
O ₂	-250; -229	0.0224; 0.178	125	-219	0.106	125
OsF ₆	-0.4	1.97	449	33.4	1.76	449
OsO ₄	white	—	—	42	(2.3)	120
	yellow	—	—	31	3.41	907
P ₄ , white	—	—	—	44	0.63	907
PCl ₃	—	—	—	-91	1.08 ± 0.2	—
POCl ₃	—	—	—	2	3.2 ± 0.6	120
P ₄ O ₆	—	—	—	24	(3.4)	121
P ₄ O ₁₀	o'rhom.b.	—	—	570	(11.5)	198
	—	—	—	<420>	—	—
H ₃ PO ₄	—	—	—	43	3.1	817
P ₂ S ₅	—	—	—	287	4.91	854

Table B. Heats and temperatures of transformation (contd.)

Substance	θ_i (°C)	λ_i (kcal/mole)	Ref.	θ_f (°C)	λ_f (kcal—mole)	Ref.
Pb	—	—	—	327	1.15 ± 0.03	288, 147
PbF ₂	340; 452	0.61; 0.65	—	818	4.16	817
PbCl ₂	—	—	—	499	5.5	939
PbBr ₂	—	—	—	370	4.96	817
PbI ₂	—	—	—	410	3.87	817
PbO	489	0.18	—	886	6.57 ± 0.3	817
PbS	—	—	—	1119	8.7	922
PbSO ₄	866	(4.1)	198	1090	(9.6)	121
PbSe	—	—	—	1076	11.8	922
PbTe	—	—	—	920	13.7	922
Pb ₄ SiO ₆	—	—	—	[725]	25.9 ± 3.0	902
Pb ₂ SiO ₄	—	—	—	743	12.8 ± 3.0	902
PbSiO ₃	—	—	—	764	8.25 ± 2.0	902
PbTiO ₃	c. 490	1.15 ± 0.1	226	—	—	—
Pd	—	—	—	1552	4.0 ± 0.1	—
PdCl ₂	—	—	—	679	4.4 ± 2.0	—
Pr	789	—	—	935	2.7 ± 0.5	121
PrCl ₃	—	—	—	786	12.1 ± 0.2	474
PrBr ₃	—	—	—	693	11.3 ± 0.2	474
PrI ₃	—	—	—	738	12.5 ± 0.4	474
Pt	—	—	—	1769	5.3 ± 0.3	—
Pu	122; 205; 318; 451; 476	0.80; 0.15; 0.13; 0.02; 0.44	595	640	0.67 ± 0.03	595
PuF ₃	—	—	—	1426	7.9 ± 1.0	185
PuF ₆	—	—	—	52	4.45	755
PuCl ₃	—	—	—	760	15.2 ± 1.5	185
PuBr ₃	—	—	—	681	14.0 ± 1.5	185
PuI ₃	—	—	—	777	12.0	755
Rb	—	—	—	39	0.525 ± 0.01	147
RbF	—	—	—	775	5.5 ± 0.4	929
RbCl	—	—	—	715	(4.4)	25
RbBr	—	—	—	680	(3.7)	25
RbI	—	—	—	640	(3.0)	25
Re	—	—	—	3180	8.0 ± 1.0	410
ReF ₆	-3	2.1	—	19	1.0 ± 0.1	—
ReF ₇	—	—	—	48	1.8 ± 0.2	566
ReOF ₄	—	—	—	108	3.25	449
ReOF ₅	30	1.34	—	41	1.2	449
Re ₂ O ₇	—	—	—	296	(15.3)	120
S	95.5	0.096	124	119	0.40 ± 0.03	198
SO ₂	—	—	—	-75.5	1.77 ± 0.03	125
SO ₃	α β γ	— — —	— — —	17 32.5 <62>	0.5 2.5 6.1	— — —
Sb ₂	—	—	—	630.5	9.5 ± 0.2	147
Sb ₄	—	—	—	630.5	19.0 ± 0.4	147
SbCl ₃	—	—	—	73	3.1 ± 0.3	121
SbCl ₅	—	—	—	3	2.4 ± 0.3	25
SbBr ₃	—	—	—	97	3.5 ± 0.3	25
SbI ₃	—	—	—	170	4.2 ± 0.6	—

Table B. Heats and temperatures of transformation (contd.)

Substance	θ_i (°C)	λ_i (kcal/mole)	Ref.	θ_f (°C)	λ_f (kcal—mole)	Ref.
SbF ₃	—	—	—	291	5.1 ± 0.6	—
Sb ₂ O ₃	—	—	—	656	13.1	907
Sb ₂ S ₃	26	0.013	—	550	11.45	854
Sb ₂ Se ₃	—	—	—	615	12.85 ± 0.5	854
Sb ₂ Te ₃	—	—	—	619	23.65 ± 0.4	854
Sc	1334	0.5	—	1538	(4.0)	—
ScCl ₃	—	—	—	967	16.1	927
Se	106	0.0	—	220	1.4 ± 0.2	854
SeF ₆	—	—	—	-35	2.0 ± 0.3	25
Si	—	—	—	1410	12.1 ± 0.4	391
SiH ₄	-210	0.147	125	-185	0.16 ± 0.01	125
SiCl ₄	—	—	—	-70	1.85 ± 0.1	125
SiI ₄	—	—	—	122	3.5 ± 0.7	—
SiO ₂	574; 806	0.175; 0.6	—	1722	2.6 ± 0.8	902
Sm	917	0.74	624	1072	2.13 ± 0.1	624
Sm ₂ O ₃	922	0.25	587	—	—	—
Sn	13	0.50 ± 0.03	147	232	1.69 ± 0.03	147
SnCl ₄	—	—	—	-34	2.2 ± 0.3	125
SnBr ₂	—	—	—	232	(1.72)	121
SnBr ₄	—	—	—	30	2.85 ± 0.5	218
SnI ₄	—	—	—	145	4.6 ± 0.2	25
SnCl ₂	—	—	—	247	(3.47)	936
SnI ₂	—	—	—	320	4.5	936
SnS	602	0.16	—	881	7.55 ± 0.2	934
SnTe	—	—	—	806	10.8	922
SnO ₂	410, 540	(0.45), (0.30)	198	—	—	—
Sr	589	0.20	—	770	2.4	99
SrF ₂	—	—	—	1477	7.09 ± 0.15	817
SrCl ₂	729	0.65	—	875	3.65 ± 0.2	531
SrBr ₂	645	(2.9)	—	657	2.5 ± 0.3	474
SrI ₂	—	—	—	538	4.7 ± 0.2	474
SrO	—	—	—	2460	16.7 ± 2.0	—
SrCO ₃	924	(4.7)	154	—	—	—
SrAl ₂ O ₄	659	0.46	—	—	—	923
Ta	—	—	—	3015	5.9 ± 0.7	—
TaF ₅	—	—	—	97	4.5	755
TaCl ₅	—	—	—	216	7.4 ± 0.8	755
TaBr ₅	—	—	—	269	10.9 ± 0.5	—
TaI ₅	—	—	—	496	(1.1)	2
Ta ₂ O ₅	—	—	—	1900	36.12	755
TbCl ₃	510	3.4	—	782	4.65	927
Tc ₂ O ₇	—	—	—	119	11.5 ± 1.7	—
Te ₂	—	—	—	450	8.36 ± 0.3	147
TeF ₄	—	—	—	130	6.35 ± 1.0	110
TeF ₆	-74	0.5	198	-38	2.1 ± 0.4	198
TeCl ₄	—	—	—	224	4.5 ± 0.1	124
TeO ₂	—	—	—	733	6.95 ± 0.2	—

Table B. Heats and temperatures of transformation (contd.)

Substance	θ_i (°C)	λ_i (kcal/mole)	Ref.	θ_f (°C)	λ_f (kcal—mole)	Ref.
Th	1360	0.86	—	1750	3.33	755
ThF ₄	—	—	—	1110	10.5	755
ThCl ₄	—	—	—	770	10.5	755
ThBr ₄	420	1.0	—	679	13.0	755
ThI ₄	—	—	—	566	11.5	755
ThC ₁₋₉₄	1430; 1490	0.5; 2.5	—	—	—	755
Ti	882	0.80 ± 0.07	408	1667	3.5 ± 0.5	—
TiCl ₄	—	—	—	—25	2.24 ± 0.1	125
TiBr ₄	—	—	—	38	3.1 ± 0.2	197
TiO	991	0.82 ± 0.2	124	2020	14.0 ± 2.0	—
TiI ₄	106	2.37	—	155	4.74	817
Ti ₂ O ₃	200	0.215	—	1839	26.4	817
TiO ₂	—	—	—	1870	16.0	902
Tl	234	0.09 ± 0.01	147	304	1.03 ± 0.03	147
TlCl	—	—	—	429	3.8 ± 0.3	463
TlBr	—	—	—	460	3.9 ± 0.2	463
TlF	83	0.08	—	322	3.32	463
TlI	178	0.22	—	442	3.52 ± 0.1	907
Tl ₂ O	—	—	—	579	7.24 ± 0.2	907
Tl ₂ SO ₄	430	~0	—	632	5.5 ± 0.5	364
U	668; 775	0.70; 1.15	124	1130	3.0 ± 0.7	—
UF ₄	—	—	—	1036	10.2	399
UF ₆	—	—	—	<64>	4.59 ± 0.05	160, 179
UCl ₄	—	—	—	590	10.7	399
UBr ₄	—	—	—	519	13.2	399
UI ₄	—	—	—	506	16.9 ± 1.8	399
UFe ₂	—	—	—	1200	16.2 ± 0.9	—
V	—	—	—	1902	4.0 ± 0.6	—
VO ₂	72	1.03 ± 0.2	124	[1360]	13.6 ± 0.3	124
V ₂ O ₅	—	—	—	670	15.6 ± 0.4	124
W	—	—	—	3410	(8.4)	23
WF ₆	-8.2	1.4	198	1	0.42 ± 0.1	449
WCl ₅	—	—	—	240	(4.2)	—
WCl ₄	230	1.73	—	281	1.54	236
WCl ₆	177; 230	1.0; 3.77	—	282	1.6	817
WO ₃	780	—	—	1472	17.55	817
WOF ₄	—	—	—	105	2.26	449
Y	1485	1.2	437	1530	2.75 ± 0.1	437
Y ₂ O ₃	1057	0.31	587	2439	—	—
YF ₃	1077	7.75 ± 0.2	—	1155	6.7 ± 0.2	937
YCl ₃	—	—	—	721	7.5	927
Zn	—	—	—	419.5	1.74 ± 0.03	147
ZnF ₂	—	—	—	875	10.0 + 3.0	907
ZnCl ₂	—	—	—	318	2.45 ± 0.2	463
ZnBr ₂	—	—	—	402	3.74 ± 0.2	463
ZnS	1020	(3.2)	—	—	—	—
Zn ₃ Sb ₂	405; 455	—	—	565	(22.0)	264
ZnSb	—	—	—	549	7.35	99
Zr	852	0.9 ± 0.1	132	1857	4.6 ± 0.7	—
ZrO ₂	1175, 2295	1.42	—	2680	20.8	902
ZrCl ₄	—	—	—	<437>	9.0 ± 2.5	584

TABLES

Table C1. Heat capacities of the elements

$$C_p = a + bT + cT^{-2} + dT^2$$

Element	C_p (cal/deg mole)				Remarks	Range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$	$d \times 10^6$			
<Ag>	5.09	2.04	0.36	—	—	298–m.p.	124
{Ag}	7.30	—	—	—	—	m.p.–1600	124
<Al>	4.94	2.96	—	—	—	298–m.p.	124
{Al}	7.6	—	—	—	—	m.p.–2400	99
<As>	5.54	1.32	—	—	—	298–sb.pt.	124
<Au>	5.66	1.24	—	—	—	298–m.p.	124
{Au}	7.00	—	—	—	—	m.p.–1600	124
	4.735	1.38	–2.20	—	—	298–1700	944
{B}	7.50	—	—	—	—	m.p.–3500	99
{B}	3.835	2.39	–1.50	—	liquid amorphous	298–1240	644
<Ba> α	—	—	—	—	—	—	—
<Ba> β	–1.36	19.2	—	—	—	673–m.p.	148
{Ba}	11.5	—	—	—	—	m.p.–1125	148
<Be> α	5.07	1.36	–1.405	+0.23	—	298–1527	755
<Be> β	7.70	—	—	—	—	1527–m.p.	755
{Be}	7.04	—	—	—	—	m.p.–2800	755
(Be)	4.97	—	—	—	—	298–1900	755
	4.53	0.14	+6.51	—	—	1900–3000	755
<Bi>	4.49	5.40	—	—	—	298–m.p.	124
{Bi}	4.78	1.47	5.05	—	—	m.p.–820	99
(Bi)	—	—	—	—	—	—	—
(Bi ₂)	—	—	—	—	—	—	—
(Br)	4.75	0.356	+0.10	—	—	298–2000	817
(Br ₂)	8.93	0.11	–0.31	—	—	298–2000	817
<C>	0.026	9.307	–0.354	–4.155	graphite	298–1100	817
	5.841	0.104	–7.559	—	—	1100–4000	817
<C>	2.18	3.16	–1.48	—	diamond	298–1200	124
<Ca> α	6.064	–1.736	—	+5.67	—	298–720	99
<Ca> β	–0.086	9.86	—	—	—	720–m.p.	99
{Ca}	7.00	—	—	—	—	m.p.–1757	99
<Cd>	5.31	2.94	—	—	—	298–m.p.	124
{Cd}	7.10	—	—	—	—	m.p.–1100	124
<Ce> α	5.613	2.485	—	+0.97	—	298–999	99
<Ce> β	8.99	—	—	—	—	999–m.p.	99
{Ce}	9.01	—	—	—	—	m.p.–1500	99
(Cl ₂)	8.82	0.06	–0.68	—	—	298–3000	124
<Co> α	5.11	3.42	–0.21	—	—	440–650	124
<Co> β	3.30	5.86	—	—	—	718–1400	124
{Co}	9.65	—	—	—	—	m.p.–1900	258
<Cr>	5.84	2.36	–0.88	—	—	298–m.p.	124
{Cr}	9.40	—	—	—	—	m.p.–	124

TABLES

Table C1. Heat capacities of the elements (contd.)

$$C_p = a + bT + cT^{-2} + dT^2$$

Element	C_p (cal/deg mole)				Remarks	Range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$	$d \times 10^6$			
{Cs}	7.62	—	—	—	—	m.p.–330	360
<Cu>	5.41	1.50	—	—	—	298–m.p.	124
{Cu}	7.50	—	—	—	—	m.p.–1600	124
(F ₂)	8.29	0.44	–0.80	—	—	298–2000	124
<Fe> $\alpha\delta$	8.873	1.474	—	—	–56.92T ^{-1/2}	298–1809	925
<Fe> γ	5.85	2.02	—	—	—	1187–1674	925
{Fe}	10.0	—	—	—	—	m.p.–1873	124
<Ga>	6.236	—	—	—	—	300	749
{Ga}	6.30	—	+0.30	—	—	m.p.–1200	99
<Ge>	5.16	1.40	—	—	—	298–m.p.	99
{Ge}	6.60	—	—	—	—	m.p.–1600	99
(H ₂)	6.52	0.78	0.12	—	—	298–3000	124
<Hf> α	5.607	1.82	—	—	—	298–1000	515
	6.315	1.696	—	—	—	1000–2023	99
{Hg}	7.26	–2.74	—	+2.427	—	298–630	99
(Hg)	6.61	—	—	—	—	298–b.p.	124
(I)	4.874	0.096	+0.067	—	—	298–2000	817
(I ₂)	8.94	0.136	–0.15	—	—	298–2000	817
<In>	5.81	2.50	—	—	—	298–m.p.	124
{In}	7.24	–0.33	—	—	—	m.p.–800	99
<Ir>	5.56	1.42	—	—	—	298–1800	124
<K>	6.04	3.12	—	—	—	298–m.p.	124
{K}	8.886	–4.57	—	+2.94	—	m.p.–1037	817
<La>	6.17	1.60	—	—	—	298–800	124
	3.33	8.21	—	—	—	298–m.p.	99
{Li}	5.85	1.31	2.07	–0.467	—	m.p.–1200	99
<Mg>	5.33	2.45	–0.103	—	—	293–m.p.	148
{Mg}	7.80	—	—	—	—	m.p.–1150	99
<Mn> α	5.70	3.38	–0.375	—	—	298–990	944
<Mn> β	8.33	0.66	—	—	—	990–1360	944
<Mn> γ	6.03	3.56	–0.443	—	—	298–1410	944
<Mn> δ	11.10	—	—	—	—	1410–1517	944
{Mn}	11.0	—	—	—	—	m.p.–b.pt.	944
<Mo>	—	—	—	—	—	—	—
{Mo}	—	—	—	—	—	—	—
(N ₂)	6.66	1.02	—	—	—	298–2500	124
<Na>	19.71	–88.27	—	150.0	—	298–m.p.	99
{Na}	8.965	–4.594	—	2.542	—	m.p.–1200	99

Table C1. Heat capacities of the elements (contd.)
 $C_p = a + bT + cT^{-2} + dT^2$

Element	C_p (cal/deg mole)				Remarks	Range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$	$d \times 10^6$			
<Nb>	—	—	—	—	—	—	—
{Nb}	—	—	—	—	—	—	—
<Nd> α	3.503	6.434	+1.07	—	—	298–1128	944
<Nd> β	10.65	—	—	—	—	1128–m.p.	944
{Nd}	11.66	—	—	—	—	m.p.–1400	944
<Ni>	4.06	7.04	—	—	—	298–633	124
	6.00	1.80	—	—	—	633–m.p.	124
{Ni}	9.20	—	—	—	—	m.p.–2000	124
(O ₂)	7.16	1.0	–0.40	—	—	298–3000	124
<Os>	5.63	0.92	—	—	—	298–2000	944
<P>wh	4.57	3.78	—	—	white	298–317	817
<P>re	4.05	3.56	—	—	red	298–870	817
{P}	6.29	—	—	—	—	317–870	817
(P ₂)	8.675	+0.19	–0.995	—	—	298–2000	817
(P ₄)	19.56	+0.16	–3.21	—	—	298–2000	817
<Pb>	5.63	2.33	—	—	—	298–m.p.	288
{Pb}	7.75	–0.74	—	—	—	m.p.–1200	288
<Pr> α	6.21	0.3	—	+3.11	—	298–1068	99
<Pr> β	9.19	—	—	—	—	1068–m.p.	99
{Pr}	10.27	—	—	—	—	m.p.–1500	99
<Pt>	—	—	—	—	—	—	—
<Pu> α	5.91	5.8	—	—	—	298–395	99
<Pu> β	5.21	7.05	—	—	—	395–480	99
<Pu> γ	2.98	11.1	—	—	—	480–588	99
<Pu> δ	9.00	—	—	—	—	588–753	99
<Pu> ϵ	8.40	—	—	—	—	753–913	99
(Rb)	7.27	—	—	—	—	298–m.p.	124
<Re>	5.66	1.3	—	—	—	298–2000	99
(Rh)	5.49	2.06	—	—	—	298–1900	124
<Ru>	5.28	1.1	—	+0.3	—	298–2000	99
{S}	107.5	–229.4	–49.92	145.1	—	388–718	944
(S)	5.40	5.50	—	—	—	m.p.–b.p.	124
(S ₂)	8.72	0.16	–0.90	—	—	298–3000	854
(S ₈)	31.49	0.16	–4.11	—	—	298–2000	854
<Sb>	5.51	1.74	—	—	—	298–m.p.	124
{Sb}	7.50	—	—	—	—	m.p.–1300	124
(Sb ₂)	8.935	—	–0.22	—	—	298–2000	99
(Sb ₄)	19.85	—	–0.44	—	—	298–2000	99
<Sc> α	6.02	0.16	—	+1.28	—	298–1608	99
<Sc> β	10.57	—	—	—	—	1608–1812	99

Table C1. Heat capacities of the elements (contd.)
 $C_p = a + bT + cT^{-2} + dT^2$

Element	C_p (cal/deg mole)				Remarks	Range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$	$d \times 10^6$			
<Se>	4.275	6.0	—	—	hexag.	298–m.p.	854
{Se}	8.4	—	—	—	—	m.p.–800	854
(Se)	5.13	0.36	–0.22	—	—	298–2000	854
(Se ₂)	10.66	–0.635	–0.598	—	—	298–2000	854
<Si>	5.72	0.59	–0.99	—	—	298–m.p.	124
{Si}	6.12	—	—	—	—	m.p.–1873	391
(Sm)	12.57	—	—	—	—	m.p.–1398	629
<Sn>wh	5.16	4.34	—	—	white	298–m.p.	99
{Sn}	8.29	–2.2	—	—	—	510–810	99
<Ta>	6.65	–0.52	–0.45	+0.47	—	298–3250	755
{Ta}	10.0	—	—	—	—	3250–4000	755
<Te>	4.58	5.25	—	—	—	273–m.p.	148
{Te}	9.0	—	—	—	—	m.p.–873	148
<Th> α	6.09	1.87	–0.122	—	—	298–1633	755
<Th> β	3.75	2.86	—	—	—	1633–m.p.	755
{Th}	11.0	—	—	—	—	m.p.–3000	755
<Ti> α	5.28	2.4	—	—	—	298–1155	944
<Ti> β	4.74	1.90	—	—	—	1155–m.p.	944
<Tl> α	3.74	6.04	+0.67	—	—	298–507	944
<Tl> β	5.00	5.00	—	—	—	507–m.p.	944
{Tl}	7.2	—	—	—	—	m.p.–1760	944
<U> α	2.61	8.95	+1.17	—	—	298–941	399
<U> β	10.0	—	—	—	—	941–1048	399
<U> γ	9.1	—	—	—	—	1048–1405	399
<V>	4.90	2.58	+0.2	—	—	298–m.p.	99
{V}	11.35	—	—	—	—	m.p.–2600	941
<W>	—	—	—	—	—	—	—
<Y> α	5.72	1.805	+0.08	—	—	298–1752	99
<Y> β	8.37	—	—	—	—	1752–m.p.	99
{Y}	9.51	—	—	—	—	m.p.–2360	904
<Zn>	5.35	2.40	—	—	—	298–m.p.	124
{Zn}	7.50	—	—	—	—	m.p.–1200	124
<Zr> α	5.25	2.78	—	—	—	298–1135	817
<Zr> β	5.55	1.11	—	—	—	1135–m.p.	817

Table C2. Heat capacities of the compounds

$$C_p = a + bT + cT^{-2} \text{ (cal/deg mole)}$$

Substance	C_p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$			
<AgCl>	14.88	1.0	-2.70	—	298-m.p.	124
{AgCl}	16.0	—	—	—	m.p.-900	124
<AgBr>	7.93	15.40	—	—	298-m.p.	124
{AgBr}	14.9	—	—	—	m.p.-900	124
<AgI> α	5.82	24.10	—	—	298-423	124
<AgI> β	13.5	—	—	—	423-600	124
<Ag ₂ O>	14.18	9.75	-1.0	—	298-500	128
<Ag ₂ S> α	10.13	26.40	—	—	298-452	124
<Ag ₂ S> β	21.64	—	—	—	452-850	124
<Ag ₂ SO ₄ >	23.1	27.9	—	—	298-m.p.	124
<Ag ₂ Se> α	23.29	0.39	-4.00	—	298-406	854
<Ag ₂ Se> β	20.4	—	—	—	406-698	124
<Ag ₃ Sb>	19.53	16.0	—	—	298-700	124
<AgNO ₃ > α	8.76	45.2	—	—	298-433	124
<AgNO ₃ > β	25.5	—	—	—	433-483	124
{AgNO ₃ }	30.6	—	—	—	483-600	124
<Ag ₂ CO ₃ >	18.97	25.85	—	—	298-450	138
<Ag ₂ CrO ₄ >	31.6	16.0	-2.13	—	298-500	817
(AlF)	8.9	—	-1.45	—	298-2000	77
<AlF ₃ > α	17.27	10.96	-2.30	—	298-727	314
<AlF ₃ > β	20.93	3.0	—	—	727-1400	314
(AlCl)	9.0	—	-0.68	—	298-2000	77
<AlCl ₃ >	13.25	28.00	—	—	273-m.p.	124
{AlCl ₃ }	31.2	—	—	—	m.p.-500	124
<AlCl ₃ >	19.8	—	-2.64	—	298-1800	77, 255
(AlBr)	8.905	0.14	-0.39	—	298-3000	817
<AlBr ₃ >	29.5	—	—	—	m.p.-500	124
{AlBr ₃ }	29.87	—	—	—	370-550	817
(Al ₂ Br ₆)	43.5	0.1	-3.12	—	298-2000	817
<AlBr ₁₂ >	50.5	27.5	-20.4	—	298-m.p.	—
<AlI ₃ >	16.88	22.66	—	—	298-m.p.	124
{AlI ₃ }	29.0	—	—	—	m.p.-500	124
(Al ₂ O)	13.18	0.373	-2.21	—	298-2000	944
(AlO)	8.45	0.334	-1.10	—	298-2000	944
<Al ₂ O ₃ >	25.48	4.25	-6.82	—	298-1800	480, 129
<Al ₂ O ₃ ·3H ₂ O>	17.30	91.2	—	—	298-425	124
(AlOF)	14.26	0.30	-3.27	—	298-2500	817
(AlOCl)	14.04	0.83	-2.08	-0.2 × 10 ⁻⁶ T ²	298-2500	817
<Al ₂ S ₃ >	24.42	8.62	—	—	298-1370	—
{Al ₂ S ₃ }	37.5	—	—	—	1370-1800	—
<Al ₂ (SO ₄) ₃ >	87.55	14.96	-26.68	—	298-1100	124
<AlN>	8.22	4.05	-2.00	—	298-1500	—
<Al ₄ C ₃ >	36.97	6.866	-10.02	—	298-1800	942
<Al ₂ SiO ₅ >	41.50	6.24	-13.85	-0.15 × 10 ⁻⁶ T ²	*298-1600	902
<Al ₂ SiO ₅ >	42.54	5.71	-13.85	kyanite	298-1500	902
<Al ₂ SiO ₅ >	40.57	6.87	-12.15	sillimanite	298-1500	902
<Al ₆ Si ₂ O ₁₃ >	55.83	151.5	-13.35	-92.25 × 10 ⁻⁶ T ²	†298-600	902
	120.38	8.39	-55.0	-0.6 × 10 ⁻⁶ T ²	†600-2123	902
<Al ₂ TiO ₅ >	43.63	5.30	-11.21	—	298-1800	280
{AsF ₃ }	30.3	—	—	—	298-b.p.	125
(AsF ₃)	18.18	—	-2.66	—	298-1000	124
(AsF ₅)	31.3	—	-7.1	—	298-2500	124

* Andalusite.

† Mullite.

Table C2. Heat capacities of the compounds (contd.)

$$C_p = a + bT + cT^{-2} \text{ (cal/deg mole)}$$

Substance	C_p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$			
{AsCl ₃ }	31.9	—	—	—	298-371	124
(AsCl ₃)	19.62	0.24	-1.42	—	298-1000	124
<As ₂ O ₃ >	14.3	42.0	—	claudetite	298-m.p.	380
<As ₂ O ₅ >	10.15	59.0	—	—	298-550	—
<As ₂ S ₃ >	25.25	8.71	—	—	298-m.p.	—
<As ₂ Te ₃ >	23.0	25.0	—	—	298-m.p.	763
<AuSb ₂ >	17.12	4.64	—	—	298-628	124
<AuSn>	11.13	3.8	—	—	298-m.p.	99
{AuSn}	14.5	—	—	—	m.p.-910	146
<AuZn>	11.51	3.56	—	—	298-m.p.	124
{AuZn}	13.6	—	—	—	m.p.-1200	124
(BF ₃)	12.44	6.70	-2.12	—	298-1000	124
(BCl ₃)	16.86	2.86	-2.44	—	298-1000	124
(BBr ₃)	17.83	2.04	-1.95	—	298-1000	124
<B ₂ O ₃ >	13.63	17.45	-3.36	—	298-m.p.	128
{B ₂ O ₃ }	30.50	—	—	—	m.p.-1800	124
<BN>	8.10	3.52	-5.51	cubic	298-1200	572
<BP>	5.25	6.7	—	—	298-1100	—
<B ₄ C>	22.99	5.40	-10.72	—	298-1373	124
<H ₃ BO ₃ >	19.44	—	—	—	298	106
<BaF ₂ >	20.75	0.9	-3.6	—	298-m.p.	—
{BaF ₂ }	22.5	—	—	—	m.p.-1900	—
<BaCl ₂ > α	22.20	0.76	-4.0	—	298-1198	531, 198
<BaCl ₂ > β	26.61	—	—	—	1198-m.p.	531
{BaCl ₂ }	24.96	—	—	—	m.p.-1339	531
<BaBr ₂ >	15.96	6.22	—	—	487-1126	531
{BaBr ₂ }	31.00	—	—	—	1126-1237	531
<BaO>	12.74	1.04	-1.984	—	298-1270	154
<Ba(OH) ₂ >	17.5	13.5	—	—	298-750	—
<BaSO ₄ >	33.80	—	-8.43	—	298-1300	124
<Ba(NO ₃) ₂ >	30.05	35.7	-4.01	—	298-850	124
<BaC ₂ >	17.6	0.9	-2.31	—	298-1500	—
<BaCO ₃ > α	20.77	11.70	-2.86	—	298-1040	154
<BaCO ₃ > β	37.0	—	—	—	1079-1241	154
<BaCO ₃ > γ	39.0	—	—	—	1241-	154
<BaSiO ₃ >	29.16	1.70	-7.46	—	298-1300	902
<BaAl ₂ O ₄ > α	34.25	17.66	-10.97	—	298-600	923
<BaAl ₂ O ₄ > β	33.03	7.56	—	—	600-1630	923
<BaMoO ₄ >	32.33	6.80	-6.00	—	298-1700	—
<BaUO ₄ >	29.04	9.62	—	—	298-1084	842
<BaTiO ₃ >	29.03	2.04	-4.58	—	298-1800	43
<Ba ₂ TiO ₄ >	43.00	1.60	-6.96	—	298-1800	43
(BeF ₂)	12.23	2.02	-1.59	—	298-1000	755
<BeF ₂ > α	14.78	0.04	-7.83	—	1000-3000	755
<BeF ₂ > β	15.56	5.15	-4.20	—	298-500	755
{BeF ₂ }	1.24	18.59	+13.14	—	500-823	755
(BeCl ₂)	13.81	7.105	-4.51	—	823-1500	755
<BeCl ₂ > α	13.89	0.83	-1.67	-0.18 × 10 ⁻⁶ T ²	298-3000	755
<BeCl ₂ > β	18.31	2.95	-3.29	—	298-688	755
<BeCl ₂ > γ	15.69	4.99	-2.01	—	298-676	755
{BeCl ₂ }	29.02	—	—	—	688-805	755
<BeO>	9.94	2.44	-4.15	-0.32 × 10 ⁻⁶ T ²	298-2835	755

TABLES

Table C2. Heat capacities of the compounds (contd.)

$$C_p = a + bT + cT^{-2} \text{ (cal/deg mole)}$$

Substance	C _p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	b × 10 ³	c × 10 ⁻⁵			
⟨Be(OH) ₂ ⟩β	4.56	36.75	-0.1	—	298-450	817
⟨BeS⟩	9.97	1.94	-2.30	—	298-1800	755
⟨BeSO ₄ ⟩α	26.96	-2.21	-6.62	+18.17 × 10 ⁻⁶ T ²	298-863	755
⟨BeSO ₄ ⟩β	38.73	—	—	—	863-908	755
⟨BeSO ₄ ⟩γ	69.32	-12.56	-171.51	+2.03 × 10 ⁻⁶ T ²	908-1500	755
⟨Be ₃ N ₂ ⟩	12.89	24.75	-4.22	—	298-430	755
⟨Be ₂ C⟩	27.37	3.60	-14.23	—	430-1200	755
⟨Be ₂ SiO ₄ ⟩	29.65	18.77	-10.84	-8.0 × 10 ⁻⁶ T ²	298-1833	755
⟨BeAl ₂ O ₄ ⟩	29.26	22.62	-8.93	-9.36 × 10 ⁻⁶ T ²	298-1200	755
—	37.58	4.10	—	—	1200-2143	755
⟨BeAl ₆ O ₁₀ ⟩	88.45	18.57	-27.75	-2.77 × 10 ⁻⁶ T ²	298-2150	755
—	9.17	10.76	-2.01	-2.29 × 10 ⁻⁶ T ²	298-2400	817
⟨BiI ₃ ⟩	9.55	26.3	0.71	—	298-682	924
⟨BiI ₃ ⟩	37.7	—	—	—	682-819	924
⟨Bi ₂ O ₃ ⟩α	24.74	8.00	—	—	298-800	124
⟨Bi ₂ O ₃ ⟩β	35.0	—	—	—	978-1097	—
⟨Bi ₂ S ₃ ⟩	26.25	9.8	—	—	298-1050	—
⟨Bi ₂ Te ₃ ⟩	36.0	13.5	-3.12	—	373-m.p.	443
(CH ₄)	5.65	11.44	-0.46	—	298-1500	124
(C ₂ H ₂)	10.43	7.565	-1.794	-1.51 × 10 ⁻⁶ T ²	298-2000	944
(CF ₄)	25.18	0.31	-23.04	+4.04 × 10 ⁻⁶ T ²	298-2000	944
(CCl ₄)	24.90	0.48	-4.74	—	298-2000	817
{CCl ₄ }	32.0	—	—	—	298-b.p.	120
⟨CBr ₄ ⟩α	31.7	—	—	—	295-320	387
⟨CBr ₄ ⟩β	33.0	—	—	—	320-m.p.	387
{CBr ₄ }	36.7	—	—	—	m.p.-450	124
(CBr ₄)	25.03	0.60	-3.03	—	298-1000	124
(CO)	6.79	0.98	-0.11	—	298-2500	124
(CO ₂)	10.55	2.16	-2.04	—	298-2500	124
(COS)	11.33	2.18	-1.83	—	298-1800	124
{CS ₂ }	18.4	—	—	—	298-b.p.	124
(CS ₂)	12.45	1.60	-1.80	—	298-1800	124
—	—	—	—	—	298-1053	—
⟨CaH ₂ ⟩	7.1	5.85	—	—	298-2000	124
(CaH)	7.68	0.74	-0.70	—	298-1424	124
⟨CaF ₂ ⟩α	14.30	7.28	0.47	—	1424-m.p.	124
⟨CaF ₂ ⟩β	25.81	2.50	—	—	m.p.-1800	124
{CaF ₂ }	23.90	—	—	—	600-m.p.	124
⟨CaCl ₂ ⟩	17.18	3.04	-0.60	—	m.p.-1700	124
{CaCl ₂ }	24.70	—	—	—	434-m.p.	531
⟨CaBr ₂ ⟩	13.96	7.86	—	—	m.p.-1123	531
{CaBr ₂ }	27.38	—	—	—	298-1177	154
⟨CaO⟩	11.86	1.08	-1.66	—	298-1000	944
⟨Ca(OH) ₂ ⟩	25.17	2.855	-4.533	—	298-2000	—
⟨CaS⟩	10.8	1.85	—	—	298-1400	124
⟨CaSO ₄ ⟩	16.78	23.60	—	—	298-450	—
⟨CaSO ₄ ·½H ₂ O⟩	16.95	39.0	—	—	298-1468	—
⟨Ca ₃ N ₂ ⟩	33.17	3.70	-6.29	—	298-1373	124
⟨Ca ₃ P ₂ O ₈ ⟩α	48.24	39.08	-5.00	—	1373-2000	124
⟨Ca ₃ P ₂ O ₈ ⟩β	79.00	—	—	—	298-1413	124
⟨Ca ₂ P ₂ O ₇ ⟩α	53.03	14.76	-11.16	—	1413-1626	55
⟨Ca ₂ P ₂ O ₇ ⟩β	76.11	—	—	—	1626-1700	55
{Ca ₂ P ₂ O ₇ }	96.85	—	—	—	298-1000	—
⟨CaHPO ₄ ⟩	33.08	13.17	-9.65	—	298-720	124
⟨CaC ₂ ⟩α	16.40	2.84	-2.07	—	—	—

TABLES

Table C2. Heat capacities of the compounds (contd.)

$$C_p = a + bT + cT^{-2} \text{ (cal/deg mole)}$$

Substance	C _p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	b × 10 ³	c × 10 ⁻⁵			
⟨CaC ₂ ⟩β	15.40	2.00	—	—	720-1275	124
⟨CaCO ₃ ⟩α,β	24.98	5.24	-6.20	calcite	298-1200	124
⟨CaO·MgO·2SiO ₂ ⟩	52.87	7.84	-15.74	diopside	298-1600	124
⟨CaSiO ₃ ⟩	25.85	3.94	-5.65	pseudowollastonite	298-1700	902
⟨CaSiO ₃ ⟩	26.64	3.60	-6.52	wollastonite	298-1450	124
β⟨Ca ₂ SiO ₄ ⟩	36.25	8.83	-7.24	—	298-1200	(243)
⟨CaTiSiO ₅ ⟩	42.39	5.54	-9.63	—	298-1670	305
{CaTiSiO ₅ }	66.8	—	—	—	1670-1811	305
⟨CaTiO ₃ ⟩α	30.47	1.36	-6.69	—	298-1530	124
⟨CaTiO ₃ ⟩β	32.03	—	—	—	1530-1800	124
⟨CaO·2B ₂ O ₃ ⟩	51.34	19.16	-17.16	—	298-m.p.	124
{CaO·2B ₂ O ₃ }	106.30	—	—	—	m.p.-1800	124
⟨CaO·B ₂ O ₃ ⟩	31.02	9.76	-8.07	—	298-m.p.	124
{CaO·B ₂ O ₃ }	61.70	—	—	—	m.p.-1700	124
⟨2CaO·B ₂ O ₃ ⟩α	43.75	11.50	-10.69	—	298-804	124
⟨2CaO·B ₂ O ₃ ⟩β	52.29	2.40	—	—	804-m.p.	124
{2CaO·B ₂ O ₃ }	68.20	—	—	—	m.p.-1900	124
⟨3CaO·B ₂ O ₃ ⟩	56.44	10.42	-13.02	—	298-m.p.	124
{3CaO·B ₂ O ₃ }	94.00	—	—	—	m.p.-1900	124
⟨Ca ₃ Al ₂ O ₆ ⟩	62.28	4.58	-12.01	—	298-1800	279
⟨CaAl ₂ O ₄ ⟩	36.0	5.96	-7.96	—	298-1800	279
⟨CaAl ₂ O ₇ ⟩	66.09	5.48	-17.8	—	298-1800	279
⟨CaFe ₂ O ₄ ⟩	39.42	4.76	-3.66	—	298-1510	348
{CaFe ₂ O ₄ }	54.90	—	—	—	1510-1800	348
⟨Ca ₂ Fe ₂ O ₅ ⟩	59.42	—	-11.68	—	298-1750	348
{Ca ₂ Fe ₂ O ₅ }	74.20	—	—	—	1750-1850	348
⟨CaWO ₄ ⟩	26.48	10.94	—	—	298-1073	940
⟨CaUO ₄ ⟩α	27.63	11.9	—	—	293-1025	842
⟨CaUO ₄ ⟩β	27.01	12.58	—	—	1025-1134	842
—	—	—	—	—	298-m.p.	—
⟨CdF ₂ ⟩	14.35	5.5	—	—	298-842	—
⟨CdCl ₂ ⟩	11.3	21.9	—	—	m.p.-1250	632
{CdCl ₂ }	26.3	—	—	—	298-m.p.	632
⟨CdBr ₂ ⟩	19.11	5.04	-2.03	—	m.p.-1150	632
{CdBr ₂ }	24.3	—	—	—	298-595	632
⟨CdI ₂ ⟩α	16.15	9.0	—	—	595-661	632
⟨CdI ₂ ⟩β	21.5	—	—	—	m.p.-1100	632
{CdI ₂ }	24.4	—	—	—	298-1500	856
⟨CdO⟩	11.53	1.525	-1.17	—	298-1200	854
⟨CdS⟩	10.65	3.30	—	—	298-m.p.	122
⟨CdSO ₄ ⟩	18.48	18.5	—	—	298-m.p.	99
⟨CdTe⟩	12.55	4.54	-1.76	—	298-700	—
⟨CdCO ₃ ⟩	10.3	31.5	—	—	298-1600	—
⟨CdTiO ₃ ⟩	27.75	2.3	4.35	—	—	—
—	—	—	—	—	298-1200	—
⟨CeH ₂ ⟩	8.40	4.6	—	—	298-m.p.	—
⟨CeF ₃ ⟩	19.2	4.0	—	—	m.p.-2420	932
{CeF ₃ }	32.0	—	—	—	298-m.p.	927
⟨CeBr ₃ ⟩	22.64	5.86	-0.07	—	m.p.-1150	927
{CeBr ₃ }	36.5	—	—	—	298-1200	884
⟨Ce ₂ O ₃ ⟩	25.77	9.9	-2.2	—	298-1250	841
⟨CeO ₂ ⟩	15.49	4.23	-1.815	—	298-2000	—
⟨CeN⟩	11.1	1.65	-1.73	—	293-1500	—
⟨Cl ₂ C ₃ ⟩	29.25	2.85	-4.8	—	298-1500	—
⟨ClC ₂ ⟩	16.4	2.2	-2.2	—	—	—

Table C2. Heat capacities of the compounds (contd.)
 $C_p = a + bT + cT^{-2}$ (cal/deg mole)

Substance	C_p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$			
{Fe ₂ SiO ₄ }	57.5	—	—	—	1490–1724	181
<FeTiO ₃ >	27.87	4.36	–4.79	—	298–1640	124
{FeTiO ₃ }	47.60	—	—	—	1640–1800	124
<Fe ₂ TiO ₄ >	33.34	15.08	–3.40	—	298–1600	280
<Fe ₂ TiO ₄ >	46.03	5.26	–7.41	—	298–1700	280
<FeW ₂ >	28.29	9.90	–1.60	—	298–1250	99
<FeCr ₂ O ₄ >	38.96	5.34	–7.62	—	298–1800	124
<Ga ₂ O ₃ >	26.98	3.69	–5.02	—	298–1800	856
<GaN>	9.1	2.15	—	—	298–1773	—
<GaP>	10.0	1.63	—	—	298–1790	—
<GaAs>	10.80	1.45	—	—	298–1238	747
<GaSb>	10.90	3.0	—	—	298–985	747
<GdCl ₃ >	20.67	8.20	+0.34	—	298–m.p.	927
{GdCl ₃ }	33.345	—	—	—	m.p.–1000	927
<GdI ₃ > _α	24.29	1.80	–1.00	—	298–1013	927
<GdI ₃ > _β	30.64	—	—	—	1013–m.p.	927
{GdI ₃ }	37.25	—	—	—	m.p.–1300	927
<Gd ₂ O ₃ >	27.28	3.54	–2.54	monoclinic	298–1852	587
<Gd ₂ O ₃ >	28.72	2.84	–3.88	cubic	298–1550	587
(GeF ₄)	23.33	2.0	–3.91	—	298–1000	256
(GeBr ₄)	25.66	0.16	–1.22	—	298–1500	124
<GeO ₂ >	15.92	2.77	–4.24	tetragonal	298–1500	754
<GeO ₂ >	16.47	2.35	–4.23	hexagonal	298–1500	—
<GeTe>	11.65	3.06	—	—	298–997	—
(HF)	6.43	0.82	0.26	—	298–2000	124
(HCl)	6.34	1.10	0.26	—	298–2000	124
(HBr)	6.25	1.40	0.26	—	298–1600	124
(HI)	6.29	1.42	0.22	—	298–2000	124
{H ₂ O}	18.03	—	—	—	273–373	124
(H ₂ O)	7.17	2.56	–0.08	—	298–2500	124
(H ₂ S)	7.81	2.96	–0.46	—	298–2000	854
{H ₂ S ₂ }	22.0	—	—	—	273–b.p.	31
<HfF ₄ >	31.9	0.75	–9.0	—	298–1100	540
<HfCl ₄ >	31.47	—	–2.38	—	298–485	181
<HfO ₂ >	17.39	2.08	–3.48	—	298–1800	181
<HfC>	12.0	1.18	–2.4	—	298–2500	—
<HfB ₂ >	15.57	4.40	–4.50	—	298–1600	572
<HgCl>	11.05	3.70	—	—	273–m.p.	124
<HgCl ₂ >	15.28	10.4	—	—	273–553	124
<HgI>	11.4	4.61	—	—	273–563	124
<HgI ₂ > _α	18.50	—	—	—	298–403	124
<HgI ₂ > _β	20.20	—	—	—	403–m.p.	124
{HgI ₂ }	25.00	—	—	—	m.p.–600	124
<HgO>	9.00	6.0	—	—	—	117
<HgS>	10.46	3.72	—	red	298–618	854
<HgS>	10.52	3.63	—	black	298–1000	854
<HoF ₃ >	25.54	0.115	–5.04	—	298–1343	901
{HoF ₃ }	39.04	–3.93	–57.14	—	1343–1416	901
{HoF ₃ }	22.85	0.04	–0.85	—	m.p.–1843	901

Table C2. Heat capacities of the compounds (contd.)
 $C_p = a + bT + cT^{-2}$ (cal/deg mole)

Substance	C_p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$			
<HCl ₃ >	22.84	3.10	–0.23	—	298–993	927
{HCl ₃ }	35.53	—	—	—	993–1100	927
<Ho ₂ O ₃ >	30.08	1.66	–2.75	—	298–1621	909
<In ₂ O ₃ >	29.6	1.9	–5.51	—	298–1600	854
<IrCl ₃ >	20.3	4.5	–1.0	—	298–1080	—
<IrO ₂ >	17.33	1.93	–3.68	—	298–1400	—
<Ir ₂ S ₃ >	26.0	9.68	–2.52	—	298–1200	—
<KF>	11.02	3.12	—	—	298–m.p.	124
<KCl>	9.89	5.20	0.77	—	298–m.p.	124
{KCl}	16.00	—	—	—	m.p.–1200	124
(KCl)	8.94	0.18	–0.24	—	298–2500	817
<KBr>	12.84	2.50	–2.84	—	600–1000	39
<KI>	21.10	–8.38	–10.38	—	600–1000	39
<K ₂ O>	22.86	–1.18	–2.64	+5.66 × 10 ^{–6} T ²	298–1100	902
<K ₂ SO ₄ > _α	28.77	23.80	–4.26	—	298–856	124
<K ₂ SO ₄ > _β	33.60	13.40	—	—	856–m.p.	124
{K ₂ SO ₄ }	47.80	—	—	—	m.p.–1700	124
<K ₂ CO ₃ >	19.19	26.06	—	—	630–m.p.	533
{K ₂ CO ₃ }	36.95	10.64	—	—	m.p.–1250	533
<LaF ₃ >	24.32	0.873	0.708	—	298–950	901
<LaF ₃ >	–12.37	27.46	+101.9	—	950–m.p.	901
<LaI ₃ >	23.22	4.735	–0.653	—	298–m.p.	927
{LaI ₃ }	36.27	—	—	—	m.p.–1200	927
<La ₂ O ₃ >	28.86	3.08	–3.28	—	298–1171	16
<LaN>	11.1	1.65	–1.73	—	298–1800	—
<LiF>	9.14	5.19	—	—	298–m.p.	288
{LiF}	15.50	—	—	—	m.p.–1170	288
<LiCl>	11.0	3.40	—	—	298–m.p.	124
<Li ₂ O>	14.94	6.08	–3.38	—	298–1045	326
<LiOH>	11.99	8.24	–2.27	—	298–m.p.	326
{LiOH}	20.74	—	—	—	m.p.–880	326
<Li ₃ N>	11.73	23.00	—	—	298–880	124
<Li ₂ CO ₃ >	3.82	42.72	—	—	560–m.p.	533
{Li ₂ CO ₃ }	30.85	13.55	—	—	m.p.–1150	533
<Li ₂ SiO ₃ >	28.39	9.86	–6.49	–1.46 × 10 ^{–6} T ²	298–m.p.	902
(LiAlF ₄)	27.50	5.03	–6.37	–1.54 × 10 ^{–6} T ²	298–2200	817
<Li ₃ AlF ₆ > _α	49.22	26.25	–7.72	—	298–748	817
<Li ₃ AlF ₆ > _β	68.0	—	—	—	748–848	817
<Li ₃ AlF ₆ > _γ	70.5	—	—	—	848–978	817
<Li ₃ AlF ₆ > _δ	73.0	—	—	—	978–1058	817
{Li ₃ AlF ₆ }	86.0	—	—	—	1058–2000	817
<Li ₂ BeF ₄ >	21.99	35.36	–0.24	—	298–m.p.	902
{Li ₂ BeF ₄ }	55.5	—	—	—	m.p.–2000	902
<LiBeF ₃ >	18.43	20.29	–2.09	—	298–633	817
<MgH ₂ >	6.50	11.8	–1.4	—	298–620	817
<MgF ₂ >	16.93	2.52	–2.20	—	298–m.p.	124
{MgF ₂ }	22.60	—	—	—	m.p.–1800	124
<MgCl ₂ >	18.90	1.42	–2.06	—	298–m.p.	124
{MgCl ₂ }	22.10	—	—	—	m.p.–1500	124
<MgO>	11.71	0.75	–2.80	—	298–3098	902

Table C2. Heat capacities of the compounds (contd.)
 $C_p = a + bT + cT^{-2}$ (cal/deg mole)

Substance	C_p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$			
<MgS>	10-30	1-97	—	—	298–2000	854
<Mg ₃ N ₂ > α	22-81	7-30	—	—	298–823	944
<Mg ₃ N ₂ > β	29-60	—	—	—	823–1061	944
<Mg ₃ N ₂ > γ	29-54	—	—	—	1061–1300	944
<Mg ₃ (PO ₄) ₂ >	29-025	80-255	+0-26	$-26.0 \times 10^{-6} T^2$	298–1621	817
{Mg ₃ (PO ₄) ₂ }	113-445	—	—	—	1621–200	817
<MgCO ₃ >	18-62	13-80	-4-16	—	298–750	124
<Mg ₂ Si>	17-52	3-58	-2-11	—	298–873	241
<MgSiO ₃ >	22-0	7-9	-4-25	clinoenstatite	298–903	902
<MgSiO ₃ >	28-76	—	—	rhomb. enstatite	903–1258	902
<MgSiO ₃ >	29-26	—	—	proto-enstatite	1258–1850	902
{MgSiO ₃ }	35-0	—	—	—	m.p.–2300	902
<Mg ₂ SiO ₄ >	35-81	6-54	-8-52	—	298–1808	181
{Mg ₂ SiO ₄ }	49-0	—	—	—	m.p.–2500	902
<Mg ₂ V ₂ O ₇ >	39-95	28-9	—	—	298–1200	977
<MgV ₂ O ₆ >	30-2	31-0	—	—	298–1100	977
<MgTiO ₃ >	28-29	3-28	-6-53	—	298–1800	124
<Mg ₂ TiO ₄ >	35-96	8-54	-6-89	—	298–1800	316
<MgTi ₂ O ₅ >	40-68	9-20	-7-35	—	298–1800	316
<MgAl ₂ O ₄ >	36-80	6-40	-9-78	—	298–1800	279
<Mg ₂ Ge>	17-55	4-3	-0-76	—	298–m.p.	963
<MgZn ₂ >	15-55	7-20	—	—	298–800	124
<MgCu ₂ >	—	additive	—	—	273–650	241
<MgAg>	—	additive	—	—	298–773	241
<MgCr ₂ O ₄ >	40-02	3-56	-9-58	—	298–1800	124
<MgNi ₂ >	15-67	7-30	—	—	298–900	124
<MnF ₂ >	14-79	5-70	-0-47	—	298–m.p.	—
<MnF ₃ >	19-6	7-4	—	—	298–1000	—
<MnCl ₂ >	18-04	3-16	-1-37	—	298–m.p.	124
{MnCl ₂ }	22-60	—	—	—	m.p.–1200	124
<MnO>	11-11	1-94	-0-88	—	298–1800	124
<Mn ₃ O ₄ > α	34-64	10-82	-2-20	—	298–1445	124
<Mn ₃ O ₄ > β	50-20	—	—	—	1445–1800	11
<Mn ₂ O ₃ >	24-73	8-38	-3-23	—	298–1350	315
<MnO ₂ >	16-60	2-44	-3-88	—	298–780	124
<MnS>	11-40	1-80	—	—	298–1803	41
{MnS}	16-00	—	—	—	1803–2000	124
<MnSO ₄ >	16-66	4-22	-1-04	—	250–350	854
<Mn ₂ N>	29-26	8-92	-7-04	—	298–1100	124
<Mn ₃ N ₂ >	22-16	30-5	—	—	298–800	124
<Mn ₃ C>	30-55	38-40	—	—	298–800	124
<Mn ₇ C ₃ >	25-26	5-60	-4-07	—	298–1310	124
<Mn ₃ Si>	58-95	13-10	-9-5	—	298–1500	—
<Mn ₃ Si>	24-11	12-45	-3-52	—	298–950	769
<Mn ₃ Si>	48-13	12-94	-4-68	—	298–m.p.	769
<MnSi>	11-79	3-05	-1-53	—	298–m.p.	769
{Mn _{0.37} Si _{0.63} }	6-37	4-085	-1-16	—	298–1425	769
<MnCo ₃ >	21-99	9-30	-4-69	—	298–700	124
<MnSiO ₃ >	26-42	3-88	-6-16	—	298–1500	124
<Mn ₂ SiO ₄ >	38-02	4-66	-7-44	—	298–m.p.	902
{Mn ₂ SiO ₄ }	58-1	—	—	—	m.p.–1800	902
<MnWO ₄ >	26-0	12-26	—	—	298–1073	940
<MoO ₃ >	20-07	5-90	-3-68	—	298–1808	181
<Mo ₂ N>	11-19	13-80	—	—	298–800	124

Table C2. Heat capacities of the compounds (contd.)
 $C_p = a + bT + cT^{-2}$ (cal/deg mole)

Substance	C_p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$			
<Mo ₂ C>	16-50	2-30	-2-74	—	298–2200	722
<Mo(CO) ₆ >	49-05	37-0	—	—	293–351	219
<Mo ₂ Si>	20-52	5-42	+0-076	—	298–2200	769
<Mo ₂ Si ₃ >	43-82	8-37	-2-87	—	298–2200	769
<MoSi ₂ >	16-22	2-86	-1-57	—	298–2200	769
<Mo ₂ B>	18-42	1-3	—	—	298–800	572
<MoB>	9-77	3-07	-1-13	—	298–1200	572
<MoB ₂ >	7-92	13-0	—	—	600–1200	572
(NH ₃)	8-92	4-46	-1-55	—	298–2400	—
(N ₂ O)	10-92	2-06	-2-04	—	298–200	124
(NO)	7-03	0-92	-0-14	—	298–2500	124
<NaF>	10-40	3-88	-0-33	—	298–m.p.	314
<NaCl>	10-98	3-90	—	—	298–m.p.	124
{NaCl}	16-0	—	—	—	m.p.–1300	124
<NaBr>	11-87	2-10	—	—	298–550	124
<Na ₂ O> α	13-26	16-78	-0-99	$-7.3 \times 10^{-6} T^2$	298–1023	902
<Na ₂ O> β	19-67	3-05	—	—	1023–1243	902
<Na ₂ O> γ	20-28	2-56	—	—	1243–m.p.	902
{Na ₂ O}	25-0	—	—	—	m.p.–2200	902
<NaOH>	17-15	-26-5	—	$+56.35 \times 10^{-6} T^2$	298–568	289
<NaOH> β	20-55	—	—	—	568–m.p.	289
{NaOH}	21-38	-1-40	—	—	m.p.–980	289
<Na ₂ S>	18-10	3-0	—	—	298–m.p.	81
{Na ₂ S}	21-52	0-22	—	—	m.p.–2000	817
<Na ₂ SO ₄ > α	23-50	31-74	—	—	298–450	285
<Na ₂ SO ₄ > γ	29-06	19-34	—	—	514–1157	285
{Na ₂ SO ₄ }	47-18	—	—	—	1157–1850	285
<Na ₂ CO ₃ >	13-98	54-4	-3-13	—	298–500	138
{Na ₂ CO ₃ }	33-99	10-7	—	—	m.p.–1210	533
<Na ₄ SiO ₄ >	38-86	17-74	—	—	298–m.p.	902
<Na ₄ SiO ₄ >	62-0	—	—	—	m.p.–1800	902
<Na ₂ SiO ₃ >	31-14	9-60	-6-47	—	298–m.p.	124
{Na ₂ SiO ₃ }	42-80	—	—	—	m.p.–1800	124
<Na ₂ Si ₂ O ₅ >	44-38	16-86	-10-67	—	298–m.p.	124
{Na ₂ Si ₂ O ₅ }	62-35	—	—	—	m.p.–1800	124
<NaBO ₂ >	12-10	12-83	—	—	298–m.p.	817
{NaBO ₂ }	35-0	—	—	—	m.p.–2000	817
<Na ₃ AlF ₆ > α	45-95	29-46	-2-78	—	298–845	314
<Na ₃ AlF ₆ > β	52-15	15-86	—	—	845–1300	314
{Na ₃ AlF ₆ }	93-4	—	—	—	1300–1400	314
<Na ₂ TiO ₃ > α	25-18	20-72	—	—	298–560	124
<Na ₂ TiO ₃ > β	25-95	17-00	—	—	560–1303	124
{Na ₂ TiO ₃ }	46-90	—	—	—	1303–1600	124
<Na ₂ Ti ₂ O ₅ >	49-32	7-06	-4-60	—	298–1258	124
{Na ₂ Ti ₂ O ₅ }	68-50	—	—	—	1258–1600	774
<Na ₂ Ti ₃ O ₇ >	63-46	10-64	-5-64	—	298–1401	124
{Na ₂ Ti ₃ O ₇ }	94-15	—	—	—	1401–1700	124
<Na ₂ CrO ₄ > α	24-15	33-46	—	—	298–694	774
<Na ₂ CrO ₄ > β	35-84	12-33	—	—	694–1070	774
{Na ₂ CrO ₄ }	48-9	—	—	—	1070–1550	774
<NbCl ₄ >	31-9	—	-2-9	—	298–600	755
<NbCl ₅ >	38-0	—	-3-0	—	298–477	755
<NbO>	10-04	2-35	-0-78	—	298–1700	488

TABLES

Table C2. Heat capacities of the compounds (contd.)

$$C_p = a + bT + cT^{-2} \text{ (cal/deg mole)}$$

Substance	C_p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$			
$\langle \text{NbO}_2 \rangle_\alpha$	14.68	6.16	-2.42	—	298-1640	755
$\langle \text{NbO}_2 \rangle_\beta$	21.28	—	—	—	1040-1700	755
$\langle \text{Nb}_2\text{O}_5 \rangle$	38.76	3.54	-7.32	—	298-1700	488
$\langle \text{Nb}_2\text{O}_5 \rangle$	57.90	—	—	—	m.p.-1810	755
$\langle \text{NbN} \rangle$	8.69	5.40	—	—	298-600	124
$\langle \text{Nb}_2\text{C} \rangle$	15.88	3.0	-2.05	—	298-1703	488
$\langle \text{NbC}_{0.75} \rangle$	8.95	2.25	-1.25	—	298-1763	488
$\langle \text{NbC} \rangle$	10.79	1.73	-2.15	—	298-1790	488
$\langle \text{Nb}_5\text{Si}_3 \rangle$	45.21	7.36	-3.60	—	298-2000	769
$\langle \text{NbSi}_2 \rangle$	15.10	3.67	-0.67	—	298-2000	769
$\langle \text{NbB}_2 \rangle$	11.23	9.21	-2.25	—	298-1400	572
$\langle \text{NbCr}_2 \rangle$	17.75	5.68	-1.76	—	298-1500	849
$\langle \text{NdF}_3 \rangle$	17.92	8.75	+4.85	—	298-1650	901
$\langle \text{NdF}_3 \rangle$	44.09	-1.06	-28.5	—	1650-1873	901
$\langle \text{NdCl}_3 \rangle$	18.65	14.6	—	—	298-m.p.	780
$\langle \text{NdCl}_3 \rangle$	35.0	—	—	—	m.p.-1250	780
$\langle \text{NdI}_3 \rangle_\alpha$	21.72	8.56	-0.15	—	298-847	927
$\langle \text{NdI}_3 \rangle_\beta$	28.06	—	—	—	847-1060	927
$\langle \text{NdI}_3 \rangle$	37.22	—	—	—	1060-1200	927
$\langle \text{Nd}_2\text{O}_3 \rangle_\alpha$	27.67	7.12	-2.84	—	298-1395	587
$\langle \text{Nd}_2\text{O}_3 \rangle_\beta$	37.20	—	—	—	1395-1795	587
$\langle \text{NiF}_2 \rangle$	15.0	4.3	—	—	298-1723	—
$\langle \text{NiCl}_2 \rangle$	17.50	3.16	-1.19	—	298-m.p.	41
$\langle \text{NiCl}_2 \rangle$	24.00	—	—	—	m.p.-1336	41
$\langle \text{NiO} \rangle_\alpha$	-4.99	37.58	+3.89	—	298-525	544
$\langle \text{NiO} \rangle_\beta$	13.88	—	—	—	525-565	544
$\langle \text{NiO} \rangle_\gamma$	11.18	2.02	—	—	565-1800	544
$\langle \text{NiS} \rangle$	9.3	6.4	—	—	298-670	—
$\langle \text{NiSO}_4 \rangle$	30.1	9.92	—	—	298-2000	124
$\langle \text{NiTe} \rangle$	11.57	3.30	—	—	298-700	124
$\langle \text{Ni}_2\text{Si} \rangle$	15.8	3.29	—	—	298-1582	124
$\langle \text{NiSi} \rangle$	11.65	1.47	-1.56	—	298-1265	769
$\langle \text{Ni}_{0.35}\text{Si}_{0.65} \rangle$	5.98	0.88	-0.86	—	298-1200	769
$\langle \text{NiB} \rangle$	10.26	3.5	-2.69	—	298-1300	—
$\langle \text{Ni}_3\text{B}_4 \rangle$	37.28	11.74	-9.03	—	298-1300	—
$\langle \text{NiAl}_2\text{O}_4 \rangle$	38.05	5.58	-7.35	—	295-1900	—
$\langle \text{NiWO}_4 \rangle$	24.38	15.7	—	—	298-1120	978
$\langle \text{NiTiO}_3 \rangle$	27.51	3.82	-4.38	—	298-1750	—
$\langle \text{Ni}_3\text{Sn} \rangle$	20.78	10.20	—	—	298-900	124
$\langle \text{OsO}_2 \rangle$	16.72	2.48	-3.39	—	298-1200	787
$\langle \text{OsO}_4 \rangle$	20.55	4.88	-3.82	—	298-1000	124
$\langle \text{PH}_3 \rangle$	9.11	2.86	-1.71	—	298-2000	124
$\langle \text{PF}_3 \rangle$	17.18	1.92	-3.88	—	298-2000	124
$\langle \text{PCl}_3 \rangle$	19.15	0.74	-1.91	—	298-1000	124
$\langle \text{PCl}_3 \rangle$	31.42	0.20	-4.27	—	298-2000	817
$\langle \text{POCl}_3 \rangle$	24.95	0.62	-4.13	—	298-2000	817
$\langle \text{PBr}_3 \rangle$	19.81	—	-1.43	—	298-1000	124
$\langle \text{P}_2\text{O}_5 \rangle$	17.90	38.8	-3.73	—	298-700	817
$\langle \text{PS} \rangle$	8.85	0.12	-0.43	—	298-2000	854
$\langle \text{PbF}_2 \rangle$	16.5	4.10	—	—	293-1097	124
$\langle \text{PbCl}_2 \rangle$	16.1	4.0	—	—	298-m.p.	939

TABLES

Table C2. Heat capacities of the compounds (contd.)

$$C_p = a + bT + cT^{-2} \text{ (cal/deg mole)}$$

Substance	C_p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$			
$\langle \text{PbCl}_2 \rangle$	28.2	—	—	—	m.p.-950	939
$\langle \text{PbCl}_2 \rangle$	13.53	0.23	—	—	298-2000	944
$\langle \text{PbBr}_2 \rangle$	18.59	2.20	—	—	298-m.p.	124
$\langle \text{PbBr}_2 \rangle$	27.60	—	—	—	m.p.-900	124
$\langle \text{PbI}_2 \rangle$	18.00	4.70	—	—	298-m.p.	124
$\langle \text{PbI}_2 \rangle$	32.40	—	—	—	m.p.-800	124
$\langle \text{PbO} \rangle_{\text{red}}$	10.95	3.75	-1.0	—	298-1000	755
$\langle \text{PbO} \rangle_{\text{yellow}}$	9.05	6.40	—	—	298-1000	124
$\langle \text{PbO} \rangle$	11.05	2.74	-0.81	—	1000-1159	755
$\langle \text{PbO} \rangle$	15.54	—	—	—	1159-1700	755
$\langle \text{Pb}_3\text{O}_4 \rangle$	32.80	7.80	—	—	298-1000	817
$\langle \text{PbO}_2 \rangle$	13.26	7.44	—	—	298-1000	—
$\langle \text{PbS} \rangle$	10.66	3.92	—	—	298-900	124
$\langle \text{PbS} \rangle$	8.92	—	-0.49	—	298-2000	124
$\langle \text{PbSO}_4 \rangle$	17.67	24.2	—	—	298-1139	—
$\langle \text{PbCO}_3 \rangle$	12.39	28.6	—	—	298-800	124
$\langle \text{PbSiO}_3 \rangle$	17.84	26.47	-2.74	$-12.94 \times 10^{-6} T^2$	298-m.p.	902
$\langle \text{PbSiO}_3 \rangle$	31.1	—	—	—	m.p.-1800	902
$\langle \text{Pb}_2\text{SiO}_4 \rangle$	30.52	19.73	-3.27	—	298-600	902
$\langle \text{Pb}_2\text{SiO}_4 \rangle$	47.71	-0.37	-21.77	—	600-m.p.	902
$\langle \text{Pb}_2\text{SiO}_4 \rangle$	45.19	—	—	—	m.p.-1800	902
$\langle \text{PbTiO}_3 \rangle$	18.7	23.3	—	—	300-850	226
$\langle \text{Pb}_{0.37}\text{Ti}_{0.63} \rangle$	4.93	4.5	—	—	298-m.p.	148
$\langle \text{PdO} \rangle$	10.83	1.68	-0.30	$+0.09 \times 10^{-6} T^2$	298-1200	—
$\langle \text{PrF}_3 \rangle$	21.81	4.88	1.99	—	298-m.p.	901
$\langle \text{PrF}_3 \rangle$	28.65	1.00	25.91	—	m.p.-1863	901
$\langle \text{PrCl}_3 \rangle$	20.6	11.4	—	—	298-m.p.	780
$\langle \text{PrCl}_3 \rangle$	32.0	—	—	—	m.p.-1250	780
$\langle \text{PrI}_3 \rangle$	21.3	9.7	—	—	298-m.p.	780
$\langle \text{PrI}_3 \rangle$	34.2	—	—	—	m.p.-1250	780
$\langle \text{Pr}_2\text{O}_3 \rangle$	23.76	12.5	—	—	298-1070	841
$\langle \text{PrO}_{1.83} \rangle$	15.88	4.36	-1.55	—	298-1172	124
$\langle \text{PtO}_2 \rangle$	13.25	0.5	-2.75	—	298-2000	—
$\langle \text{PtS} \rangle$	11.95	2.6	-2.12	—	298-1100	—
$\langle \text{PtS}_2 \rangle$	14.07	7.08	-0.4	—	298-1000	—
$\langle \text{PtS}_2 \rangle$	15.27	5.06	—	—	298-900	124
$\langle \text{PuF}_6 \rangle$	37.18	0.29	-5.65	—	298-2200	865
$\langle \text{PuO}_2 \rangle$	22.18	0.21	-4.94	—	298-m.p.	836
$\langle \text{PuC}_{0.88} \rangle$	13.08	1.14	-3.23	—	298-1400	595
$\langle \text{PuC}_{1.5} \rangle$	8.99	9.23	-0.01	$-1.59 \times 10^{-6} T^2$	298-2200	865
$\langle \text{PuCl}_2 \rangle$	14.38	6.46	-2.75	$-1.34 \times 10^{-6} T^2$	298-2525	865
$\langle \text{RbF} \rangle$	7.97	9.2	+1.21	—	298-m.p.	540
$\langle \text{RbF} \rangle$	-11.30	+0.83	+350.7	—	m.p.-1200	540
$\langle \text{RbCl} \rangle$	11.5	2.49	—	—	283-990	124
$\langle \text{RbCl} \rangle$	15.3	—	—	—	990-	—
$\langle \text{RbBr} \rangle$	17.6	2.55	—	—	283-945	124
$\langle \text{RbI} \rangle$	11.6	2.63	—	—	283-911	124
$\langle \text{ReF}_6 \rangle$	37.1	0.31	-7.65	—	298-2000	—
$\langle \text{ReCl}_3 \rangle$	25.21	6.6	-4.56	—	298-750	—
$\langle \text{Re}_2\text{O}_7 \rangle$	29.15	44.0	-2.25	—	298-570	—
$\langle \text{Re}_5\text{Si}_3 \rangle$	45.60	10.8	-3.36	—	298-1500	769

Table C2. Heat capacities of the compounds (contd.)

$$C_p = a + bT + cT^{-2} \text{ (cal/deg mole)}$$

Substance	C _p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	b × 10 ³	c × 10 ⁻⁵			
<Rh ₂ O ₃ >	20.74	13.8	—	—	291–973	274
(SO)	7.70	0.84	–0.65	—	298–2000	124
(SO ₂)	10.38	2.54	–1.42	—	298–1800	124
(SO ₃)	13.70	6.42	–3.12	—	298–1200	124
(SOCl ₂)	17.75	1.72	–2.09	—	298–1100	—
(SO ₂ Cl ₂)	12.84	19.0	—	—	298–500	124
<SbCl ₃ >	10.3	57.1	—	—	273–346	124
<SbBr ₃ >	17.2	29.3	—	—	273–370	124
<SbI ₃ >	17.0	21.2	—	—	298–m.p.	924
<SbI ₃ >	34.3	—	—	—	m.p.–b.p.	924
<Sb ₂ O ₃ >	19.10	17.1	—	—	273–930	124
<SbO ₂ >	11.3	8.1	—	—	298–1198	124
<Sb ₂ O ₅ >	10.95	57.57	—	—	298–500	944
<Sb ₂ S ₃ >	24.34	14.47	—	—	298–823	854
<Sb ₂ Te ₃ >	27.5	10.0	—	—	298–893	979
{Sb ₂ Te ₃ }	49.5	—	—	—	892–950	979
<SeF ₃ >	23.75	1.77	–2.25	—	298–1250	—
<SeCl ₃ >	22.86	3.68	–1.74	—	298–1240	927
{SeCl ₃ }	34.28	—	—	—	1240–1350	927
<Se ₂ O ₃ >	23.17	5.64	—	—	298–2500	—
<SeN>	10.95	1.3	–2.2	—	298–2000	—
(SeF ₄)	24.15	0.88	–6.58	—	298–2000	854
(SeO)	8.2	0.5	–0.8	—	298–2000	124
<SeO ₂ >	16.63	0.93	–2.64	—	298–613	854
(SeO ₂)	12.63	0.74	–2.37	—	298–2000	854
(SiF ₄)	21.86	3.17	–4.7	—	298–1000	257
(SiCl ₂)	13.76	0.09	–1.35	—	298–2200	817
{SiCl ₄ }	35.0	—	—	—	298–350	817
(SiCl ₄)	24.25	1.64	–2.75	—	298–1000	124
<SiI ₄ >	19.59	20.9	—	—	298–m.p.	706
{SiI ₄ }	35.25	9.87	—	—	m.p.–573	706
(SiI ₄)	25.57	0.24	–1.44	—	298–1000	124
<SiO ₂ >	10.49	0.24	–1.44	—	298–847	817
<SiO ₂ >	14.08	2.4	—	α-quartz	847–1079	817
<SiO ₂ >	4.28	21.06	—	β-quartz	298–523	124
<SiO ₂ >	17.39	0.31	–9.90	α-cristobalite	523–1995	817
<SiO ₂ >	3.27	24.80	—	β-cristobalite	298–390	124
<SiO ₂ >	13.64	2.64	—	α-tridymite	390–2000	124
{SiO ₂ }	13.38	3.68	–3.45	β-tridymite	298–2000	124
{SiO ₂ }	20.6	—	—	glass	—	817
<Si ₃ N ₄ >	16.86	23.6	—	liquid	—	124
<SiC>	12.14	0.47	–11.76	—	298–900	124
				+1.96 × 10 ⁸ T ⁻³	298–3260	944
<SmCl ₃ >	19.66	11.4	+0.18	—	298–m.p.	—
<Sm ₂ O ₃ >α	30.75	4.64	–4.30	monoclinic	298–1195	587
<Sm ₂ O ₃ >β	36.90	—	—	monoclinic	1195–1798	587
<Sm ₂ O ₃ >	30.64	5.08	–3.96	cubic	298–1150	587
(SnH ₄)	12.38	9.0	–2.7	—	298–800	—
<SnCl ₂ >	16.2	9.26	—	—	298–520	124
{SnCl ₄ }	39.5	—	—	—	298–400	907

Table C2. Heat capacities of the compounds (contd.)

$$C_p = a + bT + cT^{-2} \text{ (cal/deg mole)}$$

Substance	C _p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	b × 10 ³	c × 10 ⁻⁵			
(SnCl ₄)	25.57	0.20	–1.87	—	298–1000	124
<SnI ₄ >	19.4	36.0	—	—	298–m.p.	124
{SnI ₄ }	40.1	—	—	—	m.p.–450	124
<SnO>	9.55	3.50	—	—	298–1273	124
(SnO)	8.42	0.32	–0.84	—	298–2000	124
<SnO ₂ >	17.66	2.40	–5.16	—	298–1500	124
<SnS>α	8.53	7.48	0.9	—	298–875	315
<SnS>β	9.78	3.74	—	—	875–m.p.	315
<SnS ₂ >	15.51	4.20	—	—	298–1000	315
(SnS)	8.83	0.08	–0.55	—	298–2000	124
<SrF ₂ >	15.5	4.3	—	—	298–m.p.	—
<SrCl ₂ >α	15.32	9.4	—	—	298–1002	531
<SrCl ₂ >β	32.35	—	—	—	1002–m.p.	531
{SrCl ₂ }	26.66	—	—	—	m.p.–1350	531
<SrBr ₂ >α	17.95	3.22	—	—	298–918	780
<SrBr ₂ >β	27.5	—	—	—	918–930	780
{SrBr ₂ }	27.8	—	—	—	930–1200	780
<SrI ₂ >	18.6	3.05	—	—	298–m.p.	124
<SrO>	12.34	1.12	–1.81	—	298–1270	154
<SrCO ₃ >α	21.42	8.56	–3.40	—	298–1197	154
<SrCO ₃ >β	34.0	—	—	—	1197–1325	154
<SrAl ₂ O ₄ >α	42.35	1.18	–12.67	—	298–932	764
<SrAl ₂ O ₄ >β	34.92	7.0	—	—	932–1600	764
<SrWO ₄ >	28.84	8.63	—	—	298–1100	883
<SrTiO ₃ >	28.23	2.04	–4.58	—	298–1800	43
<Sr ₂ TiO ₄ >	38.45	3.84	–4.67	—	298–1800	43
<TaCl ₄ >	31.9	—	–2.0	—	298–700	755
(TaCl ₄)	25.8	—	–2.0	—	298–700	755
<TaCl ₅ >	38.0	—	–3.0	—	298–489	755
(TaCl ₅)	31.6	—	–3.7	—	298–600	755
Ta ₂ O ₅	37.0	6.56	–5.92	—	298–1800	755
<Ta ₂ N>	16.85	4.22	–1.69	—	298–3000	755
<TaN>	13.21	0.65	–3.02	—	298–3360	—
<Ta ₂ C>	15.88	3.33	–2.05	—	298–3775	755
<TaC>	10.35	2.71	–2.10	—	298–4270	755
<Ta ₅ Si ₃ >	42.95	9.35	–2.13	—	298–2000	—
<TaSi ₂ >	17.51	1.84	–2.17	—	298–2200	769
<TaB>	7.82	5.8	—	—	500–1200	572
<TaB ₂ >	14.21	4.49	–3.60	—	298–3370	755
<TaFe ₂ >	16.0	6.3	—	—	298–1300	755
(TaCr ₂)	17.65	5.45	–1.72	—	298–m.p.	849
<TeCl ₄ >	33.2	—	—	—	298–m.p.	124
{TeCl ₄ }	53.2	—	—	—	m.p.–550	124
<TeO ₂ >	15.58	3.48	–1.20	—	298–m.p.	571
{TeO ₂ }	26.92	0.52	—	—	m.p.–1146	571
(TeO ₂)	13.09	0.58	–2.83	—	298–2000	854
<ThF ₄ >	26.75	5.85	–1.81	—	298–1383	755
<ThCl ₄ >	30.35	3.24	–2.18	—	298–m.p.	980
<ThI ₄ >	31.0	3.1	–1.47	—	298–m.p.	755
<ThO ₂ >	16.65	2.13	–2.24	—	298–2500	317, 522
<Th(SO ₄) ₂ >	25.0	55.2	—	—	623–897	569
<ThN>	11.34	2.28	–1.14	—	298–2000	755

Table C2. Heat capacities of the compounds (contd.)
 $C_p = a + bT + cT^{-2}$ (cal/deg mole)

Substance	C_p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$			
$\langle \text{Th}_3\text{N}_4 \rangle$	39.33	6.24	-5.33	—	298–2000	755
$\langle \text{ThC}_{1.94} \rangle$	15.17	2.89	-2.21	—	298–1700	755
$\{\text{TiCl}_4\}$	35.7	—	—	—	285–b.p.	—
$\langle \text{TiCl}_4 \rangle$	25.45	0.24	-2.36	—	298–2000	124
$\{\text{TiBr}_4\}$	32.75	15.66	—	—	m.p.–423	197
$\langle \text{TiBr}_4 \rangle$	25.77	—	-1.58	—	> 298	197
$\langle \text{TiI}_4 \rangle_\alpha$	17.7	41.34	—	—	298–379	124
$\langle \text{TiI}_4 \rangle_\beta$	35.4	—	—	—	379–428	124
$\{\text{TiI}_4\}$	37.4	—	—	—	428–650	124
$\langle \text{TiI}_4 \rangle$	25.82	—	-0.80	—	298–2500	817
$\langle \text{TiO} \rangle_\alpha$	10.57	3.60	-1.86	—	298–1264	124
$\langle \text{TiO} \rangle_\beta$	11.85	3.00	—	—	1264–1800	124
$\langle \text{Ti}_2\text{O}_3 \rangle_\alpha$	7.31	53.52	—	—	298–473	124
$\langle \text{Ti}_2\text{O}_3 \rangle_\beta$	34.68	1.30	-10.20	—	473–1800	124
$\langle \text{Ti}_3\text{O}_5 \rangle_\alpha$	35.47	29.5	—	—	298–450	124
$\langle \text{Ti}_3\text{O}_5 \rangle_\beta$	41.60	8.0	—	—	450–1400	124
$\langle \text{TiO}_2 \rangle$	17.97	0.28	-4.35	rutile	298–1800	124
$\langle \text{TiO}_2 \rangle$	17.83	0.50	-4.23	anatase	298–1300	124
$\langle \text{TiS}_2 \rangle_\alpha$	8.08	27.34	—	—	298–420	245
$\langle \text{TiS}_2 \rangle_\beta$	14.99	5.14	—	—	420–1010	245
$\langle \text{TiN} \rangle$	11.91	0.94	-2.96	—	298–1800	124
$\langle \text{TiC} \rangle$	11.83	0.80	-3.58	—	298–1800	124
$\langle \text{TiB}_2 \rangle$	13.48	6.18	-4.17	$-0.8 \times 10^{-6} T^2$	298–3190	817
$\langle \text{TIF} \rangle_\alpha$	12.31	2.62	—	—	298–355	463
$\langle \text{TIF} \rangle_\beta$	5.29	17.78	—	—	355–595	463
$\{\text{TIF}\}$	16.08	—	—	—	m.p.–850	463
$\langle \text{TiCl} \rangle$	12.00	2.00	—	—	298–700	463
$\{\text{TiCl}\}$	14.2	—	—	—	700–850	463
$\langle \text{TiBr} \rangle$	11.07	4.95	—	—	298–m.p.	463
$\{\text{TiBr}\}$	25.25	-9.04	—	—	m.p.–950	463
$\langle \text{TiI} \rangle_\alpha$	11.56	3.32	—	—	298–451	463
$\langle \text{TiI} \rangle_\beta$	7.72	11.26	—	—	451–m.p.	463
$\{\text{TiI}\}$	17.2	—	—	—	m.p.–950	463
$\langle \text{TiI} \rangle$	9.23	—	-0.3	—	298–1600	907
$\langle \text{Ti}_2\text{O}_3 \rangle$	31.52	0.85	-5.32	—	298–m.p.	856
$\langle \text{UF}_4 \rangle$	25.7	7.00	-0.06	—	298–1309	399
$\langle \text{UF}_6 \rangle$	12.6	92.0	—	—	273–337	399
$\langle \text{UF}_6 \rangle$	22.3	28.5	—	—	273–400	399
$\langle \text{UCl}_3 \rangle$	20.8	7.75	1.05	—	298–900	399
$\langle \text{UCl}_4 \rangle$	27.2	8.57	-0.79	—	298–800	399
$\{\text{UCl}_4\}$	25.8	14.4	—	—	890–920	399
$\langle \text{UBr}_4 \rangle$	31.4	4.92	-3.15	—	350–750	399
$\langle \text{UI}_4 \rangle$	34.8	2.38	-4.72	—	380–720	399
$\{\text{UI}_4\}$	39.6	—	—	—	820–870	399
$\langle \text{UO}_2 \rangle$	19.20	1.62	-3.96	—	298–1500	124
$\langle \text{U}_3\text{O}_8 \rangle$	67.5	8.83	-11.94	—	298–900	399
$\langle \text{UO}_3 \rangle$	22.09	2.54	-2.97	—	298–900	124, 244
$\langle \text{UO}_2\text{F}_2 \rangle$	25.34	5.23	-1.02	—	298–1200	—
$\langle \text{US} \rangle$	12.63	1.56	-0.905	—	298–2000	847
$\langle \text{U}_2\text{S}_3 \rangle$	29.8	3.85	-0.9	—	298–2000	—
$\langle \text{US}_2 \rangle$	17.16	2.30	—	—	298–1833	854
$\langle \text{UC} \rangle$	13.40	1.02	-1.46	—	298–2073	—
$\langle \text{U}_2\text{C}_3 \rangle$	29.9	3.06	-3.71	—	298–2050	—

Table C2. Heat capacities of the compounds (contd.)
 $C_p = a + bT + cT^{-2}$ (cal/deg mole)

Substance	C_p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$			
$\langle \text{UC}_2 \rangle$	16.5	2.04	-2.25	—	298–2050	—
$\langle \text{UB}_2 \rangle$	25.58	-9.62	-8.48	$+5.86 \times 10^{-6} T^2$	298–2300	789
$\langle \text{VCl}_2 \rangle$	17.25	2.72	-0.71	—	298–1300	124
$\langle \text{VCl}_3 \rangle$	22.99	3.92	-1.68	—	298–900	124
$\langle \text{VO} \rangle$	11.32	3.22	-1.26	—	298–1700	315
$\langle \text{VO}_2 \rangle_\alpha$	14.96	—	—	—	298–345	124
$\langle \text{VO}_2 \rangle_\beta$	17.85	1.70	-3.95	—	345–m.p.	124
$\langle \text{VO}_2 \rangle$	25.5	—	—	—	m.p.–1900	124
$\langle \text{V}_2\text{O}_3 \rangle$	29.35	4.76	-5.42	—	298–1800	124
$\langle \text{V}_2\text{O}_5 \rangle$	46.54	-3.90	-13.22	—	298–m.p.	124
$\langle \text{V}_2\text{O}_5 \rangle$	45.60	—	—	—	m.p.–1500	124
$\langle \text{VN} \rangle$	10.94	2.10	-2.21	—	298–1600	124
$\langle \text{VC}_{0.88} \rangle$	8.69	3.18	-1.7	—	298–2000	848
$\langle \text{V}_3\text{Si} \rangle$	22.41	4.37	-1.66	—	298–1400	769
$\langle \text{VSi}_2 \rangle$	17.08	2.78	-2.25	—	298–1950	769
$\langle \text{WO}_3 \rangle$	17.48	6.79	—	—	298–1550	124
$\langle \text{WC} \rangle$	10.37	2.06	-2.23	$-0.24 \times 10^{-6} T^2$	298–2500	99
$\langle \text{W(CO)}_6 \rangle$	39.30	62.6	—	—	293–372	219
$\langle \text{WS}_2 \rangle$	16.55	3.4	-1.0	—	298–1300	—
$\langle \text{W}_3\text{Si}_3 \rangle$	42.94	9.36	-2.13	—	298–2200	769
$\langle \text{WSi}_2 \rangle$	16.21	2.64	-1.46	—	298–2200	769
$\langle \text{W}_3\text{B} \rangle$	18.46	1.44	-3.14	—	298–1200	572
$\langle \text{WB} \rangle$	13.89	-0.78	-5.02	—	298–1200	572
$\langle \text{W}_2\text{B}_3 \rangle$	39.27	2.08	-16.72	—	298–1200	572
$\langle \text{YF}_3 \rangle$	23.76	1.78	-1.36	orthorhombic	298–1350	901
$\langle \text{YF}_3 \rangle$	-76.35	50.86	+673.5	—	1350–1428	901
$\langle \text{YF}_3 \rangle$	31.96	-0.006	-0.115	—	1428–1873	901
$\langle \text{YCl}_3 \rangle$	25.03	0.77	-2.90	—	298–m.p.	927
$\langle \text{YCl}_3 \rangle$	32.44	—	—	—	m.p.–1100	927
$\langle \text{YN} \rangle$	10.9	1.55	-1.75	—	298–2200	—
$\langle \text{YbCl}_3 \rangle$	22.63	2.23	-0.45	—	298–m.p.	—
$\langle \text{Yb}_2\text{O}_3 \rangle$	30.75	4.65	-4.1	—	298–1800	—
$\langle \text{ZnCl}_2 \rangle$	14.5	5.5	—	—	298–m.p.	463
$\{\text{ZnCl}_2\}$	24.1	—	—	—	m.p.–1000	463
$\langle \text{ZnBr}_2 \rangle$	12.6	10.4	—	—	298–m.p.	463
$\{\text{ZnBr}_2\}$	27.2	—	—	—	m.p.–1000	463
$\langle \text{ZnO} \rangle$	11.71	1.22	-2.18	—	298–1600	124
$\langle \text{ZnS} \rangle$	12.16	1.24	-1.36	—	298–1200	124
$\langle \text{ZnS} \rangle$	9.08	—	-0.47	—	298–1500	907
$\langle \text{ZnSO}_4 \rangle$	21.9	18.2	—	—	298–m.p.	—
$\langle \text{ZnTe} \rangle$	11.11	2.61	—	—	298–m.p.	—
$\langle \text{Zn}_3\text{N}_2 \rangle$	19.00	22.5	—	—	273–700	204
$\langle \text{ZnCO}_3 \rangle$	9.3	33.0	—	—	298–	126
$\langle \text{Zn}_2\text{SiO}_4 \rangle$	34.63	8.83	-7.24	—	298–1785	902
$\langle \text{Zn}_2\text{TiO}_4 \rangle$	39.82	5.54	-7.69	—	298–1800	280
$\langle \text{ZnFe}_2\text{O}_4 \rangle$	37.15	10.65	-3.82	—	298–1000	17
$\langle \text{ZnWO}_4 \rangle$	27.08	9.78	—	—	298–1110	978
$\langle \text{ZrCl}_4 \rangle$	31.92	—	-2.91	—	298–s.p.	132
$\langle \text{ZrBr}_4 \rangle$	25.5	15.1	—	—	298–s.p.	120
$\langle \text{ZrO}_2 \rangle_\alpha$	16.64	1.80	-3.36	—	298–1478	132

TABLES

Table C2. Heat capacities of the compounds (contd.)

$$C_p = a + bT + cT^{-2} \text{ (cal/deg mole)}$$

Substance	C_p in cal/deg mole			Remarks	Temp. range (°K)	Ref.
	a	$b \times 10^3$	$c \times 10^{-5}$			
$\langle \text{ZrO}_2 \rangle \beta$	17.80	—	—	—	1478–1850	132
$\langle \text{ZrN} \rangle$	11.10	1.68	–1.72	—	298–1700	132
$\langle \text{ZrSiO}_4 \rangle$	31.48	3.92	–8.08	—	298–1800	132
$\langle \text{ZrB}_2 \rangle$	15.79	4.22	–3.51	—	298–1200	254

Table D. Vapour pressures and
 $\log p = A \cdot T^{-1} + B \log T$

Substance	log p (mmHg)				Remarks	Temp. range (°K)	Ref.
	A	B	C × 10 ³	D			
<Ag>	-14,900	-0.85	—	12.20	—	298-m.p.	99
{Ag}	-14,400	-0.85	—	11.70	—	m.p.-b.p.	99
<AgCl>	-11,830	-0.30	-1.02	12.39	—	298-m.p.	120
{AgCl}	-11,320	-2.55	—	17.34	—	m.p.-b.p.	120
{AgBr}	-12,400	-2.97	—	19.33	—	m.p.-b.p.	20
{AgI}	-10,250	-3.52	—	20.09	—	m.p.-b.p.	120
{Al}	-16,380	-1.0	—	12.32	—	m.p.-b.p.	446
<AlF ₃ >	-16,700	-3.02	—	23.27	—	298-s.p.	646
<Al ₂ Cl ₆ >	-6360	3.77	-6.12	9.66	—	298-s.p.	120
<Al ₂ Br ₆ >	-5280	-1.75	-4.08	20.81	—	298-m.p.	120
{Al ₂ Br ₆ }	-5280	-12.59	—	46.70	—	m.p.-b.p.	120
<Al ₂ I ₆ >	-7150	+0.12	-4.96	17.76	—	298-m.p.	120
{Al ₂ I ₆ }	-6760	-11.89	—	46.67	—	m.p.-b.p.	120
{Am}	-13,700	-1.0	—	13.97	—	1103-1453	355
<AmF ₃ >	-24,600	-7.05	—	36.87	—	1100-1300	355
<As ₄ >	-6160	—	—	9.82	—	600-900	58, 120
{AsF ₃ }	-4150	-18.26	—	61.38	—	265-292	25
{AsF ₅ }	-1088	—	—	7.72	—	m.p.-b.p.	120
{AsCl ₃ }	-2660	-5.83	—	24.76	—	m.p.-b.p.	120
<As ₄ O ₆ >	-5282	—	—	10.91	claudetite arsenolite	373-573	539
<As ₄ O ₆ >	-5452	—	—	11.468		488-573	539
<As ₂ S ₃ > _x	-5100	—	—	4.67		450-600	92
<Au>	-19,820	-0.306	-0.16	10.81	—	298-m.p.	120, 58
{Au}	-19,280	-1.01	—	12.38	—	m.p.-b.p.	120
	-29,900	-1.0	—	13.88	—	1000-m.p.	589, 409
{BCl ₃ }	-2115	-7.04	—	27.56	—	m.p.-b.p.	120
{BBr ₃ }	-2710	-7.04	—	28.36	—	m.p.-b.p.	120
{BI ₃ }	-3342	-5.4	—	24.31	—	m.p.-b.p.	6
<Ba>	-9730	—	—	7.83	—	750-m.p.	159
{Ba}	-9340	—	—	7.42	—	m.p.-	159
{BaF ₂ }	-20,330	-5.03	—	28.04	—	m.p.-b.p.	25
<BaO>	-21,900	—	—	9.99	—	1200-1700	120
<Be>	-16,730	—	0.145	9.065	—	1000-1557	89
{Be}	-17,000	-0.775	—	11.90	—	1557-2670	(89), (58)
{BeF ₂ }	-13,000	-3.98	—	24.56	—	m.p.-b.p.	217, 498
<BeCl ₂ >	-7870	-5.03	—	27.15	—	298-m.p.	25
{BeCl ₂ }	-7220	-5.03	—	26.28	—	m.p.-b.p.	25
<Be ₂ Cl ₄ >	-8970	-7.65	—	37.0	—	298-m.p.	25
<BeBr ₂ >	-7650	-5.03	—	27.15	—	298-m.p.	25
{BeBr ₂ }	-6570	-5.03	—	25.63	—	m.p.-b.p.	25
<Be ₂ Br ₄ >	-8320	-7.65	—	35.9	—	298-s.p.	25
{BeI ₂ }	-7000	-5.03	—	26.5	—	298-m.p.	25
{BeI ₂ }	-5800	-5.03	—	24.96	—	m.p.-b.p.	25
<Be ₂ I ₄ >	-8520	-7.65	—	35.9	—	298-m.p.	25

evaporation constants
+ CT + D (mmHg)

Substance	b.pt. (°C)	L_v at b.pt. (kcal/mole)	sb.pt. (°C)	L_v at m.pt. or sb.pt.	L_v at 25°C (kcal/mole)	L_v at 25°C (kcal/mole)	Ref. and remarks
Ag	2147	61.6 ± 1.5	—	66.3 ± 1.0	65.2 ± 1.5	67.9 ± 1.0	99
AgCl	1564	42.5 ± 4.0	—	51.2 ± 3.0	50.3 ± 4.0	53.6 ± 4.0	120
AgBr	1560	45.9 ± 4.0	—	—	55.0 ± 5.0	—	20
AgI	1505	34.5 ± 5.0	—	—	44.8 ± 5.0	—	120
Al	2450	69.5 ± 2.0	—	75.6 ± 2.0	—	76.9 ± 3.0	446
AlF ₃	—	—	1280	67.0 ± 3.0	—	74.5 ± 4.0	637
Al ₂ Cl ₆	<160>	9.7 ± 0.3	180	26.7 ± 0.8	—	28.8 ± 0.8	120
Al ₂ Br ₆	255	10.9 ± 0.5	—	20.3 ± 0.6	16.7 ± 0.7	21.5 ± 0.8	120
Al ₂ I ₆	385	15.4 ± 0.5	—	27.9 ± 1.5	23.9 ± 1.5	30.7 ± 1.5	120
Am	2600	57.0 ± 4.0	—	—	62.2 ± 3.5	—	355
As ₄	—	—	622	27.3 ± 2.5	—	29.0 ± 2.5	23
AsF ₃	58	7.1 ± 0.5	—	—	7.3 ± 0.5	—	25
AsF ₅	-53	5.0 ± 0.2	—	—	—	—	25
AsCl ₃	130	7.5 ± 0.4	—	—	8.7 ± 0.5	—	198
AsBr ₃	221	10.3 ± 1.8	—	14.6 ± 1.7	11.8 ± 1.5	14.6 ± 1.7	25
AsI ₃	424	14.2 ± 2.0	—	—	—	—	25
As ₄ O ₆	459	14.2 ± 1.0	—	22.3 ± 1.0*	—	30.5 ± 1.5†	120 *monocl. †orthorhomb.
Au	2950	82.0 ± 2.5	—	88.7 ± 1.5	87.7 ± 2.0	90.5 ± 2.0	120, 58
B	—	—	—	134.0 ± 3.0	—	136 ± 5.0	99
BF ₃	-101	4.6 ± 0.1	—	—	—	—	25
BCl ₃	13	5.7 ± 0.2	—	—	—	—	120
BBr ₃	91	7.3 ± 0.5	—	—	8.2 ± 0.5	—	120
BI ₃	210	10.1 ± 0.6	—	—	12.1 ± 0.7	—	6
Ba	(1700)	—	—	(44.3)	(44.4)	(46.0)	159, 120
BaF ₂	2382	64.5	—	80.0	83.3	90.1	—
BaCl ₂	(1830)	(50.0)	—	—	—	—	25
BaO	—	—	—	(90.0)	—	—	120
Be	2472	69.9	—	—	—	77.5 ± 2.0	755
BeF ₂	1175	47.65	—	—	—	55.15	755
BeCl ₂	532	25.0	—	—	—	32.5 ± 2.0	755
BeBr ₂	(511)	23.9	—	—	—	30.3 ± 2.5	755
BeI ₂	(482)	(23.0)	—	—	—	30.3 ± 2.5	755

Table D. Vapour pressures and
 $\log p = A \cdot T^{-1} + B \log T$

Substance	log <i>p</i> (mmHg)				Remarks	Temp. range (°K)	Ref.
	A	B	C × 10 ³	D			
{Bi}	-10,400	-1.26	—	12.35	—	m.p.-b.p.	350
{Bi ₂ }	-10,730	-3.02	—	18.1	—	m.p.-b.p.	350
<BiCl ₃ >	-6200	—	—	12.83	—	298-m.p.	467
{BiCl ₃ }	-5980	-7.04	—	31.38	—	m.p.-b.p.	120
{BiBr ₃ }	-6190	-7.04	—	31.40	—	m.p.-b.p.	120
{Br ₂ }	-2200	-4.15	—	19.96	—	298-390	362
{CCl ₄ }	-2400	-5.30	—	23.60	—	m.p.-b.p.	120
<CBr ₄ >	-2841	—	—	9.386	monoclin. cubic	295-319	444
<CBr ₄ >	-2579	—	—	8.567		321-329	444
{CS ₂ }	-1865	-3.13	—	16.55		m.p.-b.p.	120
<Ca>	-9350	-1.39	—	12.82		298-m.p.	99
{Ca}	-8920	-1.39	—	12.45	—	m.p.-b.p.	99
<CaF ₂ > _α	-23,600	-4.525	—	27.41	—	298-1424	—
<CaF ₂ > _β	-23,350	-4.525	—	27.23	—	1424-m.p.	612, 442
{CaF ₂ }	-21,800	-4.525	—	26.31	—	m.p.-b.p.	25
{CaCl ₂ }	-13,570	—	—	9.22	—	1110-1281	520
<Cd>	-5908	-0.232	-0.284	9.717	—	298-594	58, 120
{Cd}	-5819	-1.257	—	12.287	—	594-1050	58, 120
<CdF ₂ >	-16,170	-5.03	—	27.50	—	m.p.-b.p.	25
<CdCl ₂ >	-9270	-2.11	—	17.46	—	298-m.p.	177
{CdCl ₂ }	-9183	-5.04	—	25.907	—	m.p.-b.p.	418
<CdBr ₂ >	-8250	-2.5	—	18.15	—	298-m.p.	25
{CdBr ₂ }	-7150	-2.5	—	16.85	—	m.p.-b.p.	25
<CdI ₂ >	-7530	-2.5	—	18.01	—	298-m.p.	25
{CdI ₂ }	-6720	-2.5	—	16.79	—	m.p.-b.p.	25
<CdS>	-11,460	-2.5	—	16.06	—	298-1200	92
{Ce}	-20,304	—	—	8.207	—	1611-2038	464
<CeF ₃ >	-20,460	—	—	12.09	—	1374-1637	984
<CeCl ₃ >	-18,750	-7.05	—	36.38	—	298-m.p.	618
<CeBr ₃ >	-18,000	-7.05	—	36.49	—	298-m.p.	618
<Co>	-22,209	—	-0.223	10.817	—	298-m.p.	52
<CoCl ₂ >	-14,150	-5.03	—	30.10	—	298-m.p.	208
{CoCl ₂ }	-11,050	-5.03	—	27.06	—	m.p.-b.p.	208
<Cr>	-20,680	-1.31	—	14.56	—	298-m.p.	235, 556, 570
<CrCl ₂ >	-14,000	-0.62	-0.58	15.14	—	298-m.p.	49
{CrCl ₂ }	-13,800	-5.03	—	27.70	—	m.p.-b.p.	49
<CrCl ₃ >	-13,950	-0.73	-0.77	17.49	—	298-s.p.	49
<CrI ₂ >	-16,080	-3.53	—	25.92	—	298-m.p.	3
<CrO ₂ Cl ₂ >	-3340	-9.08	—	34.94	—	m.p.-b.p.	120
<CrO ₃ >	-10,300	—	—	20.14	—	448-468	492
<Cr(CO) ₆ >	-3738	—	—	11.75	—	274-311	982

evaporation constants (contd.)
+ CT + D (mmHg)

Substance	b.pt. (°C)	L_v at b.pt. (kcal/mole)	sb.pt. (°C)	L_v at m.pt. or sb.pt.	L_v at 25°C (kcal/mole)	L_v at 25°C (kcal/mole)	Ref. and remarks
Bi	1680	42.8 ± 2.0	—	48.9 ± 1.5	46.9 ± 1.5	49.5 ± 1.5	350
Bi ₂	1790	36.7 ± 3.0	—	51.0 ± 2.5	47.3 ± 2.5	52.5 ± 2.5	350
BiCl ₃	441	17.3 ± 1.5	—	—	23.2 ± 1.5	29.7 ± 2.5	120, 467
BiBr ₃	461	18.0 ± 1.5	—	—	24.1 ± 1.5	—	120
Bi ₂ O ₃	(1890)	—	—	—	—	—	—
Br ₂	61	7.3 ± 0.1	—	—	7.6 ± 0.1	—	362, 120
C	—	—	(4350)	—	—	170.5 ± 3	23, 298, 283
C ₂	—	—	—	—	—	195 ± 10	283, 281
CCl ₄	77	7.28 ± 0.1	—	—	7.88 ± 0.1	13.2 ± 0.5	25
CBr ₄	190	10.6 ± 0.5	—	11.7 ± 0.5	12.2 ± 0.5	13.0 ± 0.3	218, 198
COCl ₂	7.5	5.83 ± 0.05	—	—	—	—	125
CS ₂	46	6.5 ± 0.1	—	—	6.65 ± 0.1	—	120
COS	-50	4.43 ± 0.02	—	—	—	—	125
Ca	1483	36.0 ± 1.0	—	39.7 ± 0.5	40.1 ± 1.0	42.1 ± 0.5	50, 330, 398
CaF ₂	2510	74.6 ± 4.0	—	91.6 ± 3.0	97.0 ± 4.0	105.2 ± 3.0	25, 612, 442
CaCl ₂	(2000)	—	—	70.0 ± 2.0	—	73.3 ± 2.5	520
CaBr ₂	(1800)	—	—	—	—	—	—
CaO	—	—	—	—	—	149.5 ± 8.0	22
Cd	765	23.9 ± 0.3	—	26.3 ± 0.4	25.5 ± 0.5	26.75 ± 0.5	120
CdF ₂	1750	52.0 ± 4.0	—	63.5 ± 6.0	69.0 ± 6.0	—	25
CdCl ₂	961	29.6 ± 0.8	—	38.9 ± 1.0	39.0 ± 2.0	41.2 ± 2.0	347, 120
CdBr ₂	863	27.0 ± 2.0	—	33.5 ± 2.5	31.2 ± 4.0	36.2 ± 3.0	25
CdI ₂	796	25.4 ± 2.0	—	31.1 ± 3.0	29.3 ± 3.0	32.9 ± 3.0	25
Ce	(3470)	—	—	—	(92.9)	—	—
CeCl ₃	1731	—	—	70.7 ± 1.5	—	81.6 ± 2.0	618
CeBr ₃	1562	—	—	68.3 ± 1.5	—	78.2 ± 2.0	618
Cl ₂	-34.1	4.88 ± 0.05	—	—	—	—	125
Co	(2900)	—	—	98.4 ± 3.0	—	101.5 ± 4.0	52
CoCl ₂	1025	37.6 ± 2.5	—	54.6 ± 2.5	47.6 ± 4.0	61.7 ± 4.0	208, (120)
Cr	2690	81.7 ± 1.5	—	88.8 ± 0.8	—	94.8 ± 0.7	235, 570, 150
CrCl ₂	1300	47.0 ± 2.0	—	59.0 ± 1.5	59.9 ± 2.5	63.0 ± 2.5	25
CrCl ₃	—	—	945	56.8 ± 2.5	—	63.0 ± 2.5	25
CrI ₂	—	—	—	65.6 ± 1.5	—	71.4 ± 2.5	3
CrO ₂ Cl ₂	117	8.3 ± 0.8	—	—	9.9 ± 0.7	—	120
Cr(CO) ₆	—	—	151	17.2 ± 2.5	—	—	198

Table D. Vapour pressures and
 $\log p = A \cdot T^{-1} + B \log T$

Substance	log p (mmHg)				Remarks	Temp. range (°K)	Ref.
	A	B	C × 10 ³	D			
{Cs}	-4075	-1.45	—	11.38	—	280-1000	58
{CsF}	-10,930	-2.12	—	17.51	—	298-m.p.	594
{CsF}	-9950	-2.84	—	18.62	—	m.p.-b.p.	—
{CsCl}	-10,800	-3.02	—	19.99	—	700-m.p.	38, 177, 25
{CsCl}	-9815	-3.52	—	20.38	—	m.p.-b.p.	25, 38
{CsBr}	-10,950	-3.02	—	20.02	—	700-m.p.	38, 25
{CsBr}	-10,080	-3.52	—	20.56	—	m.p.-b.p.	25, 38
{CsI}	-10,420	-3.02	—	19.70	—	600-m.p.	38, 25
{CsI}	-9678	-3.52	—	20.35	—	m.p.-b.p.	25, 38
⟨Cu⟩	-17,770	-0.86	—	12.29	—	298-m.p.	85
{Cu}	-17,520	-1.21	—	13.21	—	m.p.-b.p.	85
{CuCl}	-10,170	—	—	8.04	—	1000-1900	25
⟨Cu ₃ Cl ₃ ⟩	-8156	—	—	11.235	—	548-658	619
⟨Cu ₃ Br ₃ ⟩ _α	-7674	—	—	9.693	—	578-658	619
⟨Cu ₃ Br ₃ ⟩ _β	-6756	—	—	8.30	—	670-704	619
⟨Cu ₃ Br ₃ ⟩ _γ	-6309	—	—	7.787	—	—	619
⟨Cu ₃ I ₃ ⟩ _α	-9463	—	—	11.14	—	629	619
⟨Cu ₃ I ₃ ⟩ _β	-8351	—	—	9.41	—	643-670	619
⟨Cu ₃ I ₃ ⟩ _γ	-7853	—	—	8.678	—	684-770	619
⟨Fe⟩	-21,080	-2.14	—	16.89	—	298-m.p.	52
{Fe}	-19,710	-1.27	—	13.27	—	m.p.-b.p.	52
{FeCl ₂ }	-9475	-5.23	—	26.53	—	m.p.-b.p.	322, 120
⟨Fe ₂ Cl ₆ ⟩	-10,754	-12.64	—	55.898	+ 1.335 × 10 ⁵ T ⁻²	298-m.p.	210
⟨FeI ₂ ⟩	-12,180	-5.03	—	29.59	—	298-m.p.	621, 421
{FeI ₂ }	-8750	-5.536	—	27.185	—	m.p.-b.p.	421
{Fe(CO) ₅ }	-2075	—	—	8.42	—	298-b.p.	559, 120
{Ga}	-14,330	-0.844	—	11.42	—	298-m.p.	234
{GaCl ₃ }	-4886	-6.44	—	29.14	—	m.p.-b.p.	25
{GaBr ₃ }	-4700	-6.44	—	28.69	—	m.p.-b.p.	25
⟨Ge⟩	-20,150	-0.91	—	13.28	—	298-m.p.	215
{Ge}	-18,700	-1.16	—	12.87	—	m.p.-b.p.	215
{GeCl ₄ }	-2940	-9.08	—	34.27	—	m.p.-b.p.	120
{GeBr ₄ }	-3690	-9.05	—	35.00	—	m.p.-b.p.	120
{GeI ₄ }	-4920	-4.02	—	22.73	—	298-m.p.	108
⟨GeS⟩	-8350	—	—	10.78	—	500-m.p.	469
{H ₂ O}	-2900	-4.65	—	22.613	—	m.p.-b.p.	—
{H ₂ O ₂ }	-3560	-7.04	—	29.68	—	m.p.-	120
{H ₂ S ₂ }	-1850	—	—	8.26	—	273-b.p.	31

evaporation constants (contd.)
+ CT + D (mmHg)

Substance	b.pt. (°C)	L_e at b.pt. (kcal/mole)	sb.pt. (°C)	L_e at m.pt. or sb.pt.	L_e at 25°C (kcal/mole)	L_s at 25°C (kcal/mole)	Ref. and remarks
Cs	700	15.9 $\pm$ 0.5	—	—	18.3 $\pm$ 0.5	18.8 $\pm$ 0.5	58, 120
CsF	1210	37.2 $\pm$ 1.5	—	45.9 $\pm$ 1.0	43.0 $\pm$ 1.5	48.7 $\pm$ 1.0	594
CsCl	1300	38.2 $\pm$ 2.0	—	48.6 $\pm$ 2.0	47.1 $\pm$ 2.5	52.3 $\pm$ 2.5	177, 120
CsBr	1300	36.0 $\pm$ 2.5	—	46.2 $\pm$ 2.0	44.9 $\pm$ 2.0	—	120
CsI	1280	35.9 $\pm$ 2.0	—	46.0 $\pm$ 2.0	44.7 $\pm$ 2.0	—	120
Cu	2570	73.3 $\pm$ 1.5	—	79.1 $\pm$ 1.0	79.4 $\pm$ 1.5	80.7 $\pm$ 1.5	85, 120
CuCl	1690	39.6	—	—	—	—	25
Cu ₃ Cl ₃	1595	8.0	—	—	—	—	25
CuBr	1318	(33.4)	—	—	—	—	25
"Cu ₃ Br ₃ "	1730	(8.6)	—	—	—	—	25
CuI	1207	(31.1)	—	—	—	—	25
Fe	3070	81.3 $\pm$ 3.0	—	88.7 $\pm$ 2.5	89.4 $\pm$ 4.0	95.2 $\pm$ 4.0	52, 120
FeCl ₂	1012	30.0 $\pm$ 2.0	—	44.0 $\pm$ 2.0	40.2 $\pm$ 2.5	47.5 $\pm$ 3.0	120, 322
Fe ₂ Cl ₆	315	14.5 $\pm$ 2.0	—	32.7 $\pm$ 3.0	21.7 $\pm$ 3.0	—	459
Fe ₂ Br ₆	—	—	—	—	—	34.5 $\pm$ 3.0	296
FeI ₂	935	26.7 $\pm$ 6.0	—	47.0 $\pm$ 6.0	36.7 $\pm$ 6.0	52.7 $\pm$ 6.0	421, 621
Fe(CO) ₅	109	7.8 $\pm$ 0.5	—	—	9.5 $\pm$ 0.3	—	559, 120
Ga	2420	64.6 $\pm$ 3.0	—	68.3 $\pm$ 2.5	67.0 $\pm$ 3.0	68.4 $\pm$ 3.0	457
GaCl ₃	302	15.0 $\pm$ 2.0	—	—	—	—	25
Ga ₂ Cl ₆	201	10.5 $\pm$ 1.0	—	—	—	—	25
GaBr ₃	314	14.0 $\pm$ 2.0	—	—	—	—	25
Ga ₂ Br ₆	292	12.0 $\pm$ 1.5	—	—	—	—	25
GaI ₃	349	16.2 $\pm$ 1.5	—	—	—	—	25
Ga ₂ I ₆	462	19.7 $\pm$ 2.5	—	—	—	—	25
Ge	2870	78.3 $\pm$ 3.0	—	90.0 $\pm$ 2.5	84.8 $\pm$ 3.0	91.7 $\pm$ 3.5	215, 300
GeCl ₄	84	7.1 $\pm$ 0.7	—	—	8.1 $\pm$ 0.7	—	120
GeBr ₄	189	8.6 $\pm$ 0.7	—	14.4 $\pm$ 1.2	11.5 $\pm$ 0.8	14.4 $\pm$ 1.2	120
GeI ₄	dec.	—	—	—	—	20.1 $\pm$ 2.0	108
GeO ₂	—	—	—	—	—	—	—
GeS	760	34.7 $\pm$ 3.0	—	40.5 $\pm$ 2.5	38.4 $\pm$ 4.0	43.5 $\pm$ 3.0	411, 622,
HF	19.5	*	—	—	—	—	*89.5 cal/g
H ₂ O	100	9.82 $\pm$ 0.03	—	—	10.51 $\pm$ 0.01	—	125
H ₂ O ₂	158	10.3 $\pm$ 0.8	—	—	12.2 $\pm$ 0.8	—	120
H ₂ S	-60.4	4.46 $\pm$ 0.05	—	—	—	—	125, 198
H ₂ S ₂	71	—	—	—	8.54 $\pm$ 0.8	—	31

Table D. Vapour pressures and
log $p = A \cdot T^{-1} + B \log T$

Substance	log p (mmHg)				Remarks	Temp. range (°K)	Ref.
	A	B	$C \times 10^3$	D			
$\langle \text{Hf} \rangle_\alpha$	-32,000	-0.5	—	11.81	—	298–2023	585
$\langle \text{Hf} \rangle_\beta$	-31,630	-0.5	—	11.63	—	2023–m.p.	585
$\langle \text{Hf} \rangle$	-29,830	—	—	9.20	—	m.p.–b.p.	—
$\langle \text{HfCl}_4 \rangle$	-5197	—	—	11.71	—	476–681	584
$\langle \text{HfI}_4 \rangle_\alpha$	-10,700	—	—	19.56	—	575–597	236
$\langle \text{HfI}_4 \rangle_\beta$	-7360	—	—	13.97	—	598–645	236
$\langle \text{Hg} \rangle$	-3305	-0.795	—	10.355	—	298–b.p.	30, 46
$\langle \text{HgCl}_2 \rangle$	-4580	-2.0	—	16.39	—	298–m.p.	203, 177
$\langle \text{HgBr}_2 \rangle$	-4500	0.05	-1.51	11.47	—	298–m.p.	120, 177
$\langle \text{HgBr}_2 \rangle$	-4370	-5.03	—	24.18	—	m.p.–b.p.	120
$\langle \text{HgI}_2 \rangle$	-5690	-6.47	—	30.27	—	298–m.p.	120
$\langle \text{HgI}_2 \rangle$	-4620	-5.53	—	25.72	—	m.p.–b.p.	120
$\langle \text{I}_2 \rangle$	-3578	-2.51	—	17.715	—	298–m.p.	23
$\langle \text{I}_2 \rangle$	-3205	-5.18	—	23.65	—	m.p.–b.p.	23, 120
$\langle \text{In} \rangle$	-12,580	-0.45	—	9.79	—	m.p.–b.p.	7
$\langle \text{InCl} \rangle$	-4640	—	—	8.03	—	m.p.–b.p.	194
$\langle \text{InCl}_3 \rangle$	-8270	—	—	13.62	—	500–s.p.	194
$\langle \text{InBr} \rangle$	-6470	-2.01	—	16.31	—	298–m.p.	346
$\langle \text{InBr}_2 \rangle$	-4480	—	—	7.84	—	m.p.–b.p.	194
$\langle \text{InBr}_3 \rangle$	-5670	—	—	11.67	—	500–s.p.	194
$\langle \text{InI} \rangle$	-6730	-1.97	—	15.74	—	298–m.p.	346
$\langle \text{Ir} \rangle$	-35,070	-0.7	—	13.18	—	298–m.p.	585, 511
$\langle \text{IrF}_6 \rangle$	-1657	—	—	7.952	—	m.p.–b.p.	449
$\langle \text{K} \rangle$	-4770	-1.37	—	11.58	—	350–1050	58
$\langle \text{KF} \rangle$	-12,930	-2.06	—	17.30	—	298–m.p.	594, 177
$\langle \text{KF} \rangle$	-11,570	-2.32	—	16.90	—	m.p.–b.p.	—
$\langle \text{KCl} \rangle$	-12,230	-3.0	—	20.34	—	298–m.p.	168, 120, 19
$\langle \text{KCl} \rangle$	-10,710	-3.0	—	18.91	—	m.p.–b.p.	168, 120
$\langle \text{KBr} \rangle$	-11,110	-2.0	—	16.60	—	298–m.p.	276
$\langle \text{KBr} \rangle$	-10,180	-3.0	—	18.67	—	m.p.–b.p.	120, 276
$\langle \text{KI} \rangle$	-11,000	-2.0	—	16.99	—	298–m.p.	276
$\langle \text{KI} \rangle$	-10,050	-3.52	—	20.41	—	m.p.–b.p.	120
$\langle \text{KOH} \rangle$	-10,230	-5.03	—	25.42	—	m.p.–b.p.	120
$\langle \text{La} \rangle$	-22,120	-0.33	—	10.39	—	298–m.p.	—
$\langle \text{La} \rangle$	-21,530	-0.33	—	9.89	—	m.p.–b.p.	339, 464, 454
$\langle \text{LaCl}_3 \rangle$	-19,040	-7.05	—	36.20	—	298–m.p.	618
$\langle \text{LaBr}_3 \rangle$	-18,780	-7.05	—	36.83	—	298–m.p.	618
$\langle \text{LaI}_3 \rangle$	-18,390	-7.05	—	37.00	—	298–m.p.	618
$\langle \text{Li} \rangle$	-8415	-1.0	—	11.34	—	m.p.–b.p.	290, 167
$\langle \text{LiF} \rangle$	-14,560	-4.02	—	23.56	—	m.p.–b.p.	120
$\langle \text{LiCl} \rangle$	-10,760	-4.02	—	22.30	—	m.p.–b.p.	120

evaporation constants (contd.)
+ CT + D (mmHg)

Substance	b.pt. (°C)	L_v at b.pt. (kcal/mole)	sb.pt. (°C)	L_v at m.pt. or sb.pt.	L_v at 25°C (kcal/mole)	L_v at 25°C (kcal/mole)	Ref. and remarks
H_2Se	-41	4.6 ± 0.3	—	—	—	—	198
H_2Te	-2	5.65 ± 0.4	—	—	—	—	120
Hf	4450	136.4 ± 6.0	—	142.2 ± 3.0	—	146.0 ± 4.0	585
HfCl_4	—	—	316	23.8 ± 1.0	—	27.0 ± 1.5	584
HfBr_4	—	—	322	(24.0)	—	(26.0)	25
Hg	357	14.13 ± 0.1	—	—	14.65 ± 0.1	—	30, 46
HgCl_2	304	14.1 ± 0.4	—	18.6 ± 0.5	16.8 ± 0.5	19.9 ± 0.5	120, 177
HgBr_2	319	14.1 ± 0.5	—	19.8 ± 0.2	17.0 ± 0.5	20.5 ± 0.5	120, 177
HgI_2	354	14.3 ± 0.5	—	19.8 ± 0.4	17.9 ± 0.7	$21.8(\alpha)$	120
I_2	183	9.96 ± 0.2	—	14.45 ± 0.1	11.57 ± 0.3	14.9 ± 0.1	23, 24, 124
In	2062	55.4 ± 2.0	—	57.9 ± 2.0	—	58.1 ± 2.0	7
InCl	608	20.4 ± 1.5	—	—	23.4 ± 1.5	—	194
InCl ₂	(485)	(42.1)*	—	—	—	—	194, *disprop.?
InCl ₃	—	—	498	37.8 ± 2.0	—	—	194
InBr	660	22.7 ± 1.5	—	27.4 ± 1.0	25.3 ± 1.5	28.4 ± 1.5	346
InBr ₂	631	19.7 ± 1.5	—	—	24.0 ± 2.0	—	194
InBr ₃	—	—	371	25.9 ± 2.0	—	—	194
InI	770	23.1 ± 2.0	—	28.3 ± 1.5	26.1 ± 2.0	29.6 ± 1.5	346
Ir	4390	146.3 ± 3.0	—	156.4 ± 2.0	—	160.0 ± 2.0	511, 585, 589
IrF_6	53	7.4 ± 1.0	—	—	—	9.0 ± 1.0	449
K	779	18.9 ± 0.5	—	—	21.0 ± 0.7	21.5 ± 0.7	120
KF	1510	44.6 ± 2.0	—	54.4 ± 1.5	51.4 ± 1.5	57.8 ± 1.5	594, 177
KCl	1407	39.0 ± 0.5	—	49.7 ± 0.5	47.2 ± 0.8	54.1 ± 0.8	276, 177, 120
KBr	1383	37.2 ± 0.7	—	48.7 ± 0.6	46.6 ± 1.0	51.2 ± 0.8	276, 120
KI	1330	34.7 ± 1.5	—	46.5 ± 1.5	43.5 ± 2.0	49.2 ± 2.0	276, 120
KOH	1330	30.9 ± 1.5	—	—	43.9 ± 1.5	—	120
La	3420	96.1 ± 2.0	—	99.7 ± 1.5	—	101.0 ± 1.5	339, 464, 454
LaCl_3	1812	—	—	71.3 ± 1.5	—	82.9 ± 2.0	618
LaBr_3	1586	—	—	71.1 ± 1.5	—	81.8 ± 2.0	618
LaI_3	1472	—	—	69.7 ± 1.5	—	80.0 ± 2.0	618
Li	1329	35.3 ± 2.0	—	38.3 ± 2.0	37.9 ± 2.5	38.6 ± 2.5	290, 167
LiF	1681	51.0 ± 2.0	—	63.5 ± 3.0	64.2 ± 3.0	66.5 ± 2.5	120
LiCl	1382	36.0 ± 1.5	—	47.0 ± 2.0	46.8 ± 1.8	51.0 ± 2.5	120, 177

Table D. Vapour pressures and
 $\log p = A \cdot T^{-1} + B \log T$

Substance	log <i>p</i> (mmHg)				Remarks	Temp. range (°K)	Ref.
	A	B	C × 10 ³	D			
{LiBr}	-10,170	-3.52	—	20.55	—	m.p.-b.p.	120
{LiI}	-11,110	-3.52	—	21.70	—	m.p.-b.p.	120
<Mg>	-7780	-0.855	—	11.41	—	298-m.p.	58, 253
{Mg}	-7550	-1.41	—	12.79	—	m.p.-b.p.	58, 253
<MgF ₂ >	-20,600	-2.11	—	19.06	—	298-1536	—
{MgF ₂ }	-18,150	-3.9	—	23.17	—	1536-2605	—
<MgCl ₂ >	-10,840	-5.03	—	25.53	—	m.p.-b.p.	120
{MgBr ₂ }	-10,930	-5.03	—	26.07	—	m.p.-b.p.	25
{MgI ₂ }	-8090	-5.03	—	25.18	—	m.p.-b.p.	25
<Mn>	-14,920	-1.96	—	16.19	α, β, γ, δ	298-m.p.	99
{Mn}	-14,520	-3.02	—	19.24	—	m.p.-b.p.	99
<MnF ₂ >	-17,400	-3.02	—	22.06	—	298-m.p.	432
{MnCl ₂ }	-10,606	-4.33	—	23.68	—	m.p.-b.p.	322, (120)
<Mo>	-34,700	-0.236	-0.145	11.66	—	298-m.p.	99
{MoF ₅ }	-2772	—	—	8.58	—	m.p.-b.p.	449
{MoF ₆ }	-1500	—	—	7.76	—	m.p.-b.p.	449, 120
<MoOF ₄ >	-2854	—	—	9.21	—	313-m.p.	449
{MoOF ₄ }	-2671	—	—	8.716	—	m.p.-b.p.	449
<MoCl ₅ >	-5210	—	—	13.1	—	298-m.p.	33
<MoO ₃ >	-15,230	-4.02	—	27.16	—	298-m.p.	340, 250
{MoO ₃ }	-12,480	-4.02	—	24.60	—	m.p.-b.p.	419, 239
{Na}	-5780	-1.18	—	11.50	—	298-b.p.	312, 58
<NaF>	-14,960	-2.01	—	17.53	—	298-m.p.	594, 177
{NaF}	-13,500	-2.52	—	17.93	—	m.p.-b.p.	177, 120
<NaCl>	-12,440	-0.90	-0.46	14.31	—	298-m.p.	120, 276, 168
{NaCl}	-11,530	-3.48	—	20.77	—	m.p.-b.p.	120, 168
<NaBr>	-12,100	-3.0	—	20.39	—	298-m.p.	168
{NaBr}	-10,500	-3.0	—	18.81	—	m.p.-b.p.	120
<NaBr>	-9687	—	—	8.957	—	1143-1403	20
{NaI}	-10,740	-3.52	—	20.96	—	m.p.-b.p.	120
{NaOH}	-7520	—	—	7.43	—	1280-1700	120
<Nb>	-37,650	+0.715	-0.166	8.94	—	298-m.p.	99
<NbF ₅ >	-4900	—	—	14.397	—	298-m.p.	111
{NbF ₅ }	-2780	—	—	8.37	—	m.p.-b.p.	111
<NbCl ₄ >	-6870	—	—	12.30	—	577-651	322a
<NbCl ₅ >	-4370	—	—	11.51	—	403-m.p.	206, 2
{NbCl ₅ }	-2870	—	—	8.37	—	m.p.-b.p.	206, 2
<NbOCl ₃ >	-5330	—	—	11.67	—	298-s.p.	602
{NbBr ₅ }	-4085	—	—	9.33	—	m.p.-b.p.	2
<NdCl ₃ >	-18,220	-7.05	—	36.27	—	298-m.p.	618
<NdBr ₃ >	-17,650	-7.05	—	36.51	—	298-m.p.	618
<NdI ₃ >	-17,490	-7.05	—	36.61	—	298-m.p.	618
<Ni>	-22,500	-0.96	—	13.60	—	298-m.p.	107
{Ni}	-22,400	-2.01	—	16.95	—	m.p.-b.p.	—
<NiF ₂ >	-14,650	-3.02	—	20.28	—	298-m.p.	478

evaporation constants (contd.)
 $+ CT + D$ (mmHg)

Substance	b.pt. (°C)	L_v at b.pt. (kcal/mole)	sb.pt. (°C)	L_v at m.pt. or sb.pt.	L_v at 25°C (kcal/mole)	L_v at 25°C (kcal/mole)	Ref. and remarks
LiBr	1310	35.4 ± 1.5	—	45.6 ± 2.0	44.4 ± 1.8	—	120
LiI	1170	40.8 ± 3.0	—	50.3 ± 3.5	48.8 ± 3.0	—	120
Mg	1105	30.5 ± 1.5	—	34.0 ± 1.5	33.6 ± 2.0	35.0 ± 2.0	58, 120, 253
MgF ₂	2332	65.3 ± 1.5	—	87.5 ± 1.5	83.8 ± 1.5	93.0 ± 1.5	497
MgCl ₂	1418	32.7 ± 2.0	—	50.0 ± 2.0	46.6 ± 2.5	—	120
MgBr ₂	1230	(35.0)	—	—	—	—	25
Mn	2060	52.7 ± 2.0	—	62.3 ± 1.0	—	67.1 ± 1.5	99
MnCl ₂	1231	35.6 ± 2.0	—	—	46.0 ± 3.5	—	322, (120)
Mo	4650	141.0 ± 5.0	—	151.8 ± 3.0	—	158.7 ± 3.0	99
MoF ₅	214	12.4 ± 0.5	—	—	—	—	449
MoF ₆	34	6.65 ± 0.3	—	—	6.85 ± 0.2	7.8 ± 0.2	449, 432
MoOF ₄	186	12.1 ± 0.5	—	—	—	—	449
MoCl ₅	268	15.0 ± 3.5	—	23.5 ± 3.0	—	—	33
MoO ₃	1100	46.0 ± 2.5	—	61.0 ± 2.5	54.6 ± 2.5	67.2 ± 2.5	419, 340
N ₂	-196	1.333 ± 0.01	—	—	—	—	125
NH ₃	-33.5	5.58 ± 0.02	—	—	—	—	125
Na	882	23.7 ± 0.4	—	26.2 ± 0.5	25.7 ± 0.6	26.35 ± 0.6	312, 58
NaF	1710	51.8 ± 2.0	—	63.3 ± 2.0	60.2 ± 2.5	67.2 ± 2.0	177, 594
NaCl	1465	40.7 ± 0.2	—	52.5 ± 0.5	50.5 ± 0.7	56.1 ± 0.8	276, 177, 120
NaBr	1393	38.0 ± 1.0	—	49.2 ± 1.5	45.5 ± 2.0	53.5 ± 1.5	168, 177, 120
NaI	1304	38.1 ± 1.0	—	48.6 ± 1.5	47.1 ± 1.5	51.6 ± 1.5	120
NaOH	1390	(34.5)	—	(36.5)	—	—	120
NbF ₅	233	12.5 ± 3.0	—	22.4 ± 2.5	14.3 ± 3.0	23.0 ± 3.0	111, (120)
NbCl ₅	250	13.1 ± 0.8	—	20.0 ± 1.0	—	—	206, 2
NbOCl ₃	—	—	335	24.4 ± 1.0	—	26.1 ± 1.5	602
NbBr ₅	361	18.7 ± 1.0	—	—	—	—	2
NdCl ₃	1674	—	—	68.9 ± 1.5	—	79.2 ± 2.0	618
NdBr ₃	1495	—	—	67.4 ± 1.5	—	76.6 ± 2.0	618
NdI ₃	1437	—	—	65.4 ± 1.5	—	75.95 ± 2.0	618
Ni	2920	89.6 ± 4.0	—	99.7 ± 3.0	—	102.6 ± 3.0	107, 120
NiF ₂	(1740)	—	—	56.7 ± 2.0	—	65.3 ± 2.0	478

Table D. Vapour pressures and
 $\log p = A \cdot T^{-1} + B \log T$

Substance	log p (mmHg)				Remarks	Temp. range (°K)	Ref.
	A	B	C × 10 ³	D			
⟨NiCl ₂ ⟩	−13,300	−2.68	—	21.88	—	298−s.p.	322, 120
⟨NiBr ₂ ⟩	−13,110	−1.71	−0.35	16.68	—	298−s.p.	207
{Ni(CO) ₄ }	−1530	—	—	7.73	—	298−b.p.	120
⟨NpF ₆ ⟩	−2892	−2.7	—	18.48	—	273−327	567
{NpF ₆ }	−1913	−2.347	—	14.613	—	328−350	567
⟨Os⟩	−39,880	—	—	10.365	—	2157−2592	451
{OsF ₅ }	−3429	—	—	9.75	—	m.p.−b.p.	449
⟨OsF ₆ ⟩	−1858	—	—	8.726	—	273−m.p.	449
{OsF ₆ }	−1473	—	—	7.47	—	m.p.−b.p.	449
⟨OsO ₄ ⟩	−2955	—	—	9.64	yellow white	273−329	120
⟨OsO ₄ ⟩	−2580	—	—	10.70		273−315	120
{OsO ₄ }	−2065	—	—	8.01		m.p.−b.p.	120
⟨P ₄ ⟩	−3530	−3.5	—	19.09	white	298−m.p.	44, 120
⟨P ₄ ⟩	−7240	—	—	12.85	black	298−m.p.	120
⟨P ₄ ⟩	−5600	—	—	11.00	violet	298−m.p.	120
{P ₄ }	−2740	—	—	7.84	—	m.p.−b.p.	120
{PCl ₃ }	−2370	−5.14	—	22.74	—	273−b.p.	120
⟨PCl ₅ ⟩	−3520	—	—	11.035	—	373−432	25
⟨P ₄ O ₁₀ ⟩	−4940	—	—	10.70	hexagonal o'rhomboh	298−631	120
⟨P ₄ O ₁₀ ⟩ _α	−8250	—	—	12.55		298−842	120
{POCl ₃ }	−1830	—	—	7.72		273−b.p.	120
{Pb}	−10,130	−0.985	—	11.16	—	m.p.−b.p.	77, 58, 120
{PbF ₂ }	−11,800	−5.03	—	26.48	—	m.p.−b.p.	120
⟨PbCl ₂ ⟩	−9890	−0.95	−0.91	15.36	—	298−m.p.	120
{PbCl ₂ }	−10,000	−6.65	—	31.60	—	m.p.−b.p.	120, 177
⟨PbBr ₂ ⟩	−9320	−2.08	−0.34	18.44	—	298−m.p.	100, 120
{PbBr ₂ }	−9540	−6.76	—	31.67	—	m.p.−b.p.	120
⟨PbI ₂ ⟩	−9340	−2.35	−0.32	19.68	—	298−m.p.	120, (177)
{PbI ₂ }	−10,000	−9.21	—	39.80	—	m.p.−b.p.	120
⟨PbO⟩	−13,480	−0.92	−0.35	14.36	—	298−m.p.	120
⟨PbS⟩	−13,300	−0.81	−0.43	14.85	—	298−1200	120, 252, 92
⟨Pd⟩	−19,800	−0.755	—	11.82	—	298−m.p.	423, 511, 473
{Pd}	−17,500	+1.0	—	4.81	—	m.p.−b.p.	—
{Po}	−5810	−1.0	—	10.70	—	m.p.−b.p.	351
{Pr}	−17,190	—	—	8.10	—	1425−1692	99
⟨PrCl ₃ ⟩	−18,490	−7.05	—	36.31	—	298−m.p.	618
⟨PrBr ₃ ⟩	−17,800	−7.05	—	36.53	—	298−m.p.	618
⟨PrI ₃ ⟩	−17,470	−7.05	—	36.66	—	298−m.p.	618
⟨Pt⟩	−28,460	−1.27	—	14.33	—	298−m.p.	58
{Pt}	−27,890	−1.77	—	15.71	—	m.p.−b.p.	58

evaporation constants (contd.)
 $+ CT + D$ (mmHg)

Substance	b.pt. (°C)	L_e at b.pt. (kcal/mole)	sb.pt. (°C)	L_e at m.pt. or sb.pt.	L_e at 25°C (kcal/mole)	L_e at 25°C (kcal/mole)	Ref. and remarks
NiCl_2	—	—	970	53.8 ± 2.0	—	59.1 ± 2.0	322, 120
NiBr_2	—	—	919	53.7 ± 1.5	—	58.9 ± 1.5	207
Ni_3S_2	—	—	—	—	—	—	—
$\text{Ni}(\text{CO})_4$	42	7.0 ± 0.2	—	—	7.0 ± 0.3	—	120
NpF_6	55	7.2 ± 0.2	—	11.45 ± 0.2	7.35 ± 0.2	11.6 ± 0.2	567
O_2	-183	1.63 ± 0.01	—	—	—	—	125
Os	5030	—	—	—	—	189.0 ± 3.0	451
OsF_5	226	15.7 ± 3.0	—	—	—	—	449
OsF_6	47.5	6.72	—	—	—	—	449
OsO_4	130	9.45 ± 0.7	—	11.8 ± 0.7	—	—	120
P_4	280	12.4 ± 0.7	—	13.9 ± 0.5	13.4 ± 0.5	14.05 ± 0.5	44, 120
	—	—	453	33.1 ± 3.0	—	—	120
	—	—	413	25.6 ± 3.0	—	—	120
PCl_3	75	7.3 ± 0.3	—	—	7.7 ± 0.3	—	120, 25
PCl_5	166*	—	—	14.0 ± 2.5	—	—	25, *dec.
PBr_3	174	9.5 ± 0.4	—	—	—	—	25
PI_3	(230)	10.5 ± 0.7	—	—	—	—	25
P_4O_6	175	10.4 ± 2.0	—	—	—	—	120
P_4O_{10}	600	(26.0)	—	(37.8)	—	—	120
	—	—	360	(17.6)	—	—	198
POCl_3	105	8.4 ± 0.5	—	11.6 ± 0.8	8.4 ± 0.5	—	120
Pb	1740	42.5 ± 0.5	—	46.4 ± 0.6	45.8 ± 0.7	46.9 ± 0.7	77, 58, 120
PbF_2	1293	38.3 ± 3.0	—	—	51.0 ± 5.0	—	120
PbCl_2	952	30.3 ± 1.2	—	42.0 ± 1.2	42.6 ± 1.2	45.0 ± 1.5	347, 120
PbBr_2	914	27.7 ± 2.0	—	39.3 ± 2.0	39.6 ± 2.0	41.3 ± 2.0	120
PbI_2	872	24.6 ± 1.0	—	38.6 ± 1.0	40.3 ± 1.5	41.2 ± 1.5	120
PbO	—	—	—	—	—	—	—
Pd	2940	86.4 ± 2.5	—	87.8 ± 0.7	—	90.1 ± 0.7	473, 511, 423
PdCl_2	(1200)	—	—	34.1 ± 2.0	—	—	582
Po	965	24.1 ± 2.0	—	—	26.0 ± 2.0	—	351
Pr	(3020)	—	—	—	—	—	—
PrCl_3	1709	—	—	69.75 ± 1.5	—	80.4 ± 2.0	618
PrBr_3	1522	—	—	67.9 ± 1.5	—	77.25 ± 2.0	618
PrI_3	1422	—	—	65.8 ± 1.5	—	75.7 ± 2.0	618
Pt	4170	112.1 ± 6.0	—	125.8 ± 4.0	126.6 ± 5.0	130.2 ± 5.0	58, 473, 511

Table D. Vapour pressures and
log $p = A \cdot T^{-1} + B \log T$

Substance	log p (mmHg)				Remarks	Temp. range (°K)	Ref.
	A	B	C × 10 ³	D			
{Pu}	-17,590	—	—	7.90	—	1392-1793	99
<PuF ₃ >	-24,950	-7.05	—	36.91	—	298-m.p.	355, 185
{PuF ₃ }	-23,500	-6.45	—	34.47	—	m.p.-200	185
<PuCl ₃ >	-18,270	-5.34	—	32.60	—	298-m.p.	185
{PuCl ₃ }	-15,490	-6.45	—	31.76	—	m.p.-b.p.	185
<PuBr ₃ >	-17,460	-5.34	—	31.32	—	298-m.p.	185
{PuBr ₃ }	-15,030	-6.45	—	32.34	—	m.p.-b.p.	185
{Rb}	-4688	-1.76	—	13.07	—	813-1258	658
<RbF>	-12,600	-2.66	—	19.59	—	298-m.p.	594
{RbF}	-11,230	-2.66	—	18.26	—	m.p.-b.p.	—
<RbCl>	-11,670	-3.0	—	20.157	—	298-m.p.	168
{RbCl}	-10,300	-3.0	—	18.77	—	m.p.-b.p.	168, 120
<RbBr>	-11,510	-3.0	—	20.155	—	298-m.p.	168
{RbBr}	-10,220	-3.0	—	18.805	—	m.p.-b.p.	168, 120
{RbI}	-10,280	-3.52	—	20.64	—	m.p.-b.p.	120
<Re>	-40,800	-1.16	—	14.20	—	298-3000	410
{ReF ₅ }	-3037	—	—	9.025	—	m.p.-b.p.	449
<ReF ₆ >	-1489	—	—	7.73	—	m.p.-b.p.	449
<ReF ₇ >	-2206	-1.47	—	13.045	—	259-m.p.	566
{ReF ₇ }	-244.3	+9.91	—	-21.585	—	m.p.-b.p.	566
<ReOF ₄ >	-3888	—	—	11.88	—	323-m.p.	449
{ReOF ₄ }	-3206	—	—	10.09	—	m.p.-b.p.	449
<ReOF ₅ > _β	-1959	—	—	8.62	—	303-m.p.	449
{ReOF ₅ }	-1679	—	—	7.73	—	m.p.-b.p.	449
<ReO ₂ F ₃ >	-3437	—	—	10.36	—	m.p.-b.p.	449
<Re ₂ O ₇ >	-6775	—	—	13.67	—	413-478	492
<Rh>	-29,360	-0.88	—	13.50	—	298-m.p.	473, 511, 585
<Ru>	-32,770	—	—	10.38	—	1940-2377	451
<RuCl ₃ >	-16,750	-4.63	—	30.53	—	298-1000	434
<S ₂ >	-6750	—	—	11.32	—	298-m.p.	21, 120
{S ₂ }	-6975	-1.53	-1.0	16.22	—	m.p.-b.p.	21, 122
{S _x }	-4830	-5.0	—	23.88	total p	m.p.-b.p.	21
<SO ₃ > _α	-2680	—	—	11.44	—	273-m.p.	120
<SO ₃ > _β	-2860	—	—	11.97	—	273-m.p.	120
<SO ₃ > _γ	-3610	—	—	14.00	—	273-m.p.	120
{SO ₃ }	-2230	—	—	9.90	—	m.p.-b.p.	120
{SO ₂ Cl ₂ }	-1660	—	—	7.65	—	m.p.-b.p.	120
<Sb ₄ >	-10,320	—	—	10.59	total p	500-m.p.	99
{Sb ₄ }	-6500	—	—	6.37	total p	m.p.-b.p.	99
<Sb ₄ >	-11,560	-3.52	—	22.40	—	298-m.p.	Richards
<SbCl ₃ >	-3460	3.88	-5.6	2.81	—	298-m.p.	120
{SbCl ₃ }	-3770	-7.04	—	29.48	—	m.p.-b.p.	120
{SbCl ₅ }	-2530	—	—	8.56	—	m.p.-350	120
{SbBr ₃ }	-4760	-4.54	—	23.68	—	m.p.-b.p.	983

evaporation constants (contd.)
+ CT + D (mmHg)

Substance	b.pt. (°C)	L_v at b.pt. (kcal/mole)	sb.pt. (°C)	L_v at m.pt. or sb.pt.	L_v at 25°C (kcal/mole)	L_v at 25°C (kcal/mole)	Ref. and remarks
Pu	(3230)	82.1 ± 8.0	—	81.0 ± 7.0	—	84.1 ± 8.0	99
PuF ₃	(2120)	(76.6)	—	96.6 ± 2.5	103 ± 4.0	108.5 ± 4.0	185
PuF ₆	62	7.2 ± 0.8	—	—	—	—	595
PuCl ₃	1790	44.4 ± 2.5	—	72.8 ± 2.5	67.0 ± 3.0	80.4 ± 3.5	185
PuBr ₃	1475	46.2 ± 3.0	—	69.9 ± 2.5	64.9 ± 3.0	76.7 ± 3.5	185
Rb	673	18.1 ± 1.0	—	20.9 ± 1.0	20.4 ± 1.0	20.9 ± 1.0	658
RbF	1390	42.5 ± 1.5	—	52.1 ± 1.5	49.5 ± 1.5	55.7 ± 1.5	594
RbCl	1381	39.6 ± 2.0	—	(48.6)	49.1 ± 2.0	—	177, 120, 168
RbBr	1352	37.0 ± 1.0	—	(44.7)	45.0 ± 2.0	—	168, 120
RbI	1304	36.0 ± 1.0	—	(43.0)	44.9 ± 2.0	—	120
Re	(5650)	—	—	178.0 ± 2.5	—	186.1 ± 2.0	410, 99
ReF ₆	33.7	6.8 ± 0.2	—	—	6.9 ± 0.3	7.85 ± 0.2	566, 449
ReF ₇	74	8.55 ± 0.2	—	9.15 ± 0.2	7.0 ± 0.2	9.2 ± 0.2	566
ReOF ₄	172	14.6 ± 0.5	—	17.8 ± 0.5	—	—	449
ReOF ₅	73	7.7 ± 0.4	—	8.95 ± 0.5	—	—	449
ReO ₂ F ₃	185	15.7 ± 0.5	—	—	—	—	449
Re ₂ O ₇	362	18.0 ± 3.5	—	33.4 ± 3.5	—	—	120
Rh	3760	—	—	129.4 ± 2.0	—	132.8 ± 2.5	511, 473
S	444.6*	—	—	—	—	—	*S _x
S ₂	625	25.4 ± 1.0	—	30.7 ± 1.0	30.5 ± 1.0	31.05 ± 1.0	21, 122
S ₄	625	22.9 ± 3.0	—	31.5 ± 3.0	30.7 ± 3.0	31.75 ± 3.0	21
S ₆	527	15.8 ± 2.5	—	26.9 ± 2.5	25.95 ± 2.5	27.45 ± 2.5	21
S ₈	490	15.1 ± 2.5	—	29.1 ± 2.5	27.95 ± 2.5	30.0 ± 2.5	21
S ₂ F ₁₀	29	7.0 ± 0.2	—	—	7.0 ± 0.2	—	25
S ₂ Cl ₂	138	8.7 ± 0.1	—	—	—	—	25
SO ₂	-10	5.96 ± 0.05	—	—	—	—	125
SO ₃	43	—	—	11.76	—	—	198
SO ₂ Cl ₂	69	7.5 ± 0.2	—	—	7.8 ± 0.2	—	120
SOCl ₂	76	7.4 ± 0.3	—	—	7.7 ± 0.3	—	120
Sb ₂	1675	39.4 ± 0.8	—	56.0 ± 0.8	49.3 ± 1.0	—	321, 23
Sb ₄	—	—	—	46.6 ± 1.0	33.6 ± 1.0	50.8 ± 2.0	321, 23
SbCl ₃	220	10.4 ± 0.3	—	15.5 ± 0.3	13.1 ± 0.4	15.8 ± 0.4	120
SbCl ₅	dec.	—	—	—	11.7 ± 2.5	—	120
SbBr ₃	280	(14.1)	—	—	15.1 ± 2.5	—	239

Table D. Vapour pressures and
 $\log p = A \cdot T^{-1} + B \log T$

Substance	$\log p$ (mmHg)				Remarks	Temp. range (°K)	Ref.
	A	B	$C \times 10^3$	D			
$\langle \text{SbI}_3 \rangle$	-3600	—	—	8.25	—	474-674	239
$\langle \text{Sb}_4\text{O}_6 \rangle$	-10,360	—	—	12.195	cubic	742-839	120
$\langle \text{Sb}_4\text{O}_6 \rangle$	-9625	—	—	11.312	orthorhombic	742-914	120
$\langle \text{Sb}_4\text{O}_6 \rangle$	-3900	—	—	5.137	—	929-1073	120
$\langle \text{Sc} \rangle_\beta$	-19,700	-1.0	—	13.07	—	1607-m.p.	554, 623, 339
$\langle \text{ScCl}_3 \rangle$	-14,200	—	—	14.37	—	1065-1233	25
$\langle \text{ScBr}_3 \rangle$	-13,780	—	—	14.35	—	1042-1200	25
$\langle \text{ScI}_3 \rangle$	-13,340	—	—	14.17	—	1010-1180	25
$\langle \text{Se}_x \rangle$	-4990	—	—	8.09	mainly (Se_6)	m.p.-b.p.	28
$\langle \text{SeF}_4 \rangle$	-2457	—	—	9.44	—	m.p.-b.p.	183
$\langle \text{SeO}_2 \rangle_x$	-4995	—	—	10.98	—	420-492	492
$\langle \text{Si} \rangle$	-20,900	-0.565	—	10.78	—	m.p.-b.p.	502, 468
$\langle \text{Si} \rangle$	-23,550	-0.565	—	12.35	—	298-m.p.	—
$\langle \text{SiCl}_4 \rangle$	-1572	—	—	7.64	—	273-333	119
$\langle \text{SiI}_4 \rangle$	-3863	-5.0	—	23.38	—	m.p.-b.p.	6
$\langle \text{Sm} \rangle$	-11,170	-1.56	—	13.76	—	298-m.p.	405, 517
$\langle \text{Sn} \rangle$	-15,500	—	—	8.23	—	505-b.p.	99
$\langle \text{SnCl}_4 \rangle$	-1925	—	—	7.865	—	298-b.p.	112, 86
$\langle \text{SnBr}_4 \rangle$	-3510	-6.5	—	27.63	—	303-b.p.	112, 218
$\langle \text{SnI}_4 \rangle$	-3990	—	—	10.08	—	298-m.p.	218
$\langle \text{SnI}_4 \rangle$	-2975	—	—	7.666	—	m.p.-b.p.	112, 218, 25
$\langle \text{SnS} \rangle$	-10,460	—	—	9.97	—	890-m.p.	321
$\langle \text{Sr} \rangle$	-9450	-1.31	—	13.08	—	813-m.p.	398
$\langle \text{Sr} \rangle$	-9000	-1.31	—	12.63	—	m.p.-b.p.	398, 120
$\langle \text{SrF}_2 \rangle$	-21,660	-5.03	—	28.04	—	m.p.-b.p.	25
$\langle \text{SrO} \rangle$	-27,500	-2.0	—	17.74	dec?	298-1600	169
$\langle \text{Ta} \rangle$	-40,800	—	—	10.29	—	298-m.p.	99
$\langle \text{TaCl}_4 \rangle$	-6600	—	—	11.71	—	—	615
$\langle \text{TaCl}_5 \rangle$	-4654	—	—	12.197	—	—	601
$\langle \text{TaCl}_5 \rangle$	-2865	—	—	8.54	—	m.p.-b.p.	601
$\langle \text{TaBr}_5 \rangle$	-7320	-7.04	—	34.85	—	298-m.p.	273, 2
$\langle \text{TaBr}_5 \rangle$	-3260	—	—	8.14	—	m.p.-b.p.	273, 2
$\langle \text{TaI}_5 \rangle$	-6660	-7.04	—	31.61	—	298-m.p.	2
$\langle \text{TaI}_5 \rangle$	-3955	—	—	7.72	—	m.p.-b.p.	2
$\langle \text{Tc}_2\text{O}_7 \rangle$	-7205	—	—	18.28	—	298-m.p.	284
$\langle \text{Tc}_2\text{O}_7 \rangle$	-3570	—	—	9.00	—	m.p.-b.p.	284

evaporation constants (contd.)
 $+ CT + D$ (mmHg)

Substance	b.pt. (°C)	L_v at b.pt. (kcal/mole)	sb.pt. (°C)	L_v at m.pt. or sb.pt.	L_v at 25°C (kcal/mole)	L_v at 25°C (kcal/mole)	Ref. and remarks
SbI_3	400	16.4 ± 2.0	—	20.6 ± 3.0 (44.0)	—	—	239
Sb_4O_6	1425	—	—	—	—	—	120
Sb_4S_6	—	—	—	(51.2)	—	—	252, (92) *298°K
Sc	(2870)	—	—	86.3 ± 3.0	—	89.9 ± 4.5	554, 623, 339
ScCl_3	967	—	—	65.0 ± 3.0	—	—	25
ScBr_3	—	—	929	63.0 ± 3.0	—	—	25
ScI_3	—	—	909	61.0 ± 3.0	—	—	25
Se_6	695	(21.5)	—	—	—	—	28, 205
SeF_4	102	—	—	—	11.3 ± 1.0	—	183
SeF_6	—	—	-46	6.4 ± 0.5	—	—	25
Si	3280	91.6 ± 2.5	—	105.8 ± 2.0	95.3 ± 2.5	107.8 ± 2.5	502, 468
SiH_4	-112	2.96 ± 0.05	—	—	—	—	125
SiF_4	-97	4.5 ± 0.3	-95	6.15 ± 0.3	—	—	25
SiCl_4	58	6.8 ± 0.4	—	—	7.2 ± 0.4	—	119, 25
SiBr_4	153	9.05 ± 0.2	—	—	—	—	25
SiI_4	301	12.0 ± 0.6	—	—	14.75 ± 0.7	—	6
Sm	1800	39.4 ± 4.0	—	45.9 ± 1.5	—	49.6 ± 1.5	405, 517
Sm_2O_3	—	—	—	—	—	—	—
Sn	2623	70.8 ± 2.0	—	71.9 ± 1.5	—	72.2 ± 1.5	215, 282
SnCl_2	652	19.5 ± 2.0	—	—	25.8 ± 3.0	—	25
SnCl_4	115	8.1 ± 0.4	—	—	9.3 ± 0.3	—	112, 86
SnBr_2	639	23.3 ± 2.0	—	—	30.0 ± 3.0	—	25
SnBr_4	207	9.8 ± 0.8	—	—	12.2 ± 1.2	—	112, 218
SnI_2	715	23.8 ± 2.0	—	—	34.0 ± 3.0	—	25
SnO_2	—	—	—	—	—	—	—
Sr	1350	36.9 ± 3.0	—	40.6 ± 3.0	40.4 ± 3.0	—	398, 120
SrF_2	2480	71.5 ± 5.0	—	86.5 ± 5.0	96.0 ± 6.0	(100.0)	25
SrO	—	—	—	—	—	124.8 ± 4.0	169
Ta	—	—	—	187.8 ± 2.5	—	186.9 ± 1.5	99
TaCl_4	—	—	—	—	—	32.5 ± 2.0	601
TaCl_5	234	12.0 ± 0.8	—	20.9 ± 1.0	—	22.3 ± 1.5	601
TaBr_5	347	14.9 ± 0.7	—	25.8 ± 1.0	—	29.25 ± 1.0	2, 273
TaI_5	545	17.9 ± 1.5	—	19.5 ± 1.5	—	25.2 ± 2.0	2
Tc_2O_7	312	14.0 ± 1.5	—	30.2 ± 1.5	21.2 ± 1.0	31.7 ± 2.0	—

Table D. Vapour pressures and
 $\log p = A \cdot T^{-1} + B \log T$

Substance	$\log p$ (mmHg)				Remarks	Temp. range (°K)	Ref.
	A	B	$C \times 10^3$	D			
$\langle \text{Te}_2 \rangle$	-9175	-2.71	—	19.68	—	298-m.p.	—
$\{\text{Te}_2\}$	-7830	-4.27	—	22.29	—	m.p.-b.p.	563, 28, 294
$\langle \text{TeF}_4 \rangle$	-3174	—	—	9.093	—	298-m.p.	110
$\{\text{TeF}_4\}$	-1787	—	—	5.640	—	m.p.-467	110
$\langle \text{TeF}_6 \rangle$	-1460	—	—	9.13	—	194-241	120
$\{\text{TeCl}_2\}$	-3350	—	—	8.51	—	m.p.-b.p.	25
$\langle \text{TeO}_2 \rangle$	-13,940	-3.52	—	23.51	—	298-m.p.	250
$\langle \text{Th} \rangle$	-30,200	-1.0	—	12.95	—	298-m.p.	466
$\langle \text{ThCl}_4 \rangle$	-12,900	—	—	14.30	—	974-1043	25
$\{\text{ThCl}_4\}$	-7980	—	—	9.57	—	1043-1186	25
$\langle \text{ThBr}_4 \rangle$	-9630	—	—	11.73	—	903-951	25
$\{\text{ThBr}_4\}$	-7550	—	—	9.56	—	955-1126	25
$\langle \text{ThI}_4 \rangle$	-6890	—	—	9.09	—	856-1107	25
$\langle \text{ThO}_2 \rangle$	-31,600	—	—	10.1	—	2000-2800	339
$\langle \text{Ti} \rangle_\beta$	-24,400	-0.91	—	13.18	—	1155-m.p.	450, 52, 15
$\{\text{Ti}\}$	-23,200	-0.66	—	11.74	—	m.p.-b.p.	—
$\langle \text{TiF}_4 \rangle$	-5332	-2.57	—	19.51	—	298-s.p.	369
$\langle \text{TiCl}_2 \rangle$	-15,230	-2.51	—	19.36	—	298-m.p.	145
$\{\text{TiCl}_2\}$	-13,110	-2.51	—	17.93	—	m.p.-b.p.	145
$\{\text{TiCl}_4\}$	-2919	-5.788	—	25.129	—	298-b.p.	211
$\{\text{TiBr}_4\}$	-3621	—	—	11.26	—	275-311	982
$\langle \text{TiI}_2 \rangle$	-12,500	-1.51	—	16.90	—	298-1000	84
$\{\text{TiI}_4\}$	-3054	—	—	7.576	—	430-643	15
$\langle \text{Tm} \rangle$	-12,550	—	—	9.18	—	807-1219	99
$\{\text{Ti}\}$	-9300	-0.892	—	11.10	—	700-1800	58
$\langle \text{TIF} \rangle$	-7710	-2.18	—	17.66	—	298-m.p.	344
$\langle \text{TiCl} \rangle$	-7370	-2.11	—	16.49	—	298-m.p.	344
$\{\text{TiCl}\}$	-6650	-2.62	—	16.92	—	m.p.-b.p.	344, 120
$\langle \text{TiBr} \rangle$	-7420	-2.0	—	16.18	—	298-m.p.	344
$\{\text{TiBr}\}$	-6840	-3.02	—	18.26	—	m.p.-b.p.	344, 120
$\langle \text{TiI} \rangle$	-7270	-2.01	—	15.85	—	298-m.p.	344
$\{\text{TiI}\}$	-6890	-3.02	—	18.20	—	m.p.-b.p.	344, 120
$\langle \text{U} \rangle$	-25,580	-2.62	—	18.58	—	298-m.p.	399
$\{\text{U}\}$	-24,090	-1.26	—	13.20	—	m.p.-b.p.	399
$\langle \text{UF}_4 \rangle$	-16,400	-3.02	—	22.60	—	298-m.p.	399
$\{\text{UF}_4\}$	-15,300	-5.03	—	28.05	—	m.p.-b.p.	399
$\langle \text{UF}_6 \rangle$	-3312	-5.53	—	26.843	—	273-m.p.	399
$\{\text{UF}_6\}$	-1502	—	—	7.50	—	m.p.-b.p.	399
$\langle \text{UCl}_4 \rangle$	-11,350	-3.02	—	23.21	—	298-m.p.	399
$\{\text{UCl}_4\}$	-9950	-5.53	—	28.96	—	m.p.-b.p.	399
$\langle \text{UCl}_6 \rangle$	-4000	—	—	10.20	—	298-450	399
$\langle \text{UBr}_3 \rangle$	-16,420	-3.02	—	22.95	—	298-m.p.	399
$\{\text{UBr}_3\}$	-15,000	-5.03	—	27.54	—	m.p.-b.p.	399
$\langle \text{UBr}_4 \rangle$	-10,800	-3.02	—	23.15	—	298-m.p.	399
$\{\text{UBr}_4\}$	-8770	-5.53	—	27.93	—	m.p.-b.p.	399

evaporation constants (contd.)
 $+ CT + D$ (mmHg)

Substance	b.pt. (°C)	L_v at b.pt. (kcal/mole)	sb.pt. (°C)	L_v at m.pt. or sb.pt.	L_v at 25°C (kcal/mole)	L_v at 25°C (kcal/mole)	Ref. and remarks
Te_2	998	25.0 ± 2.0	—	38.0 ± 2.0	33.3 ± 2.0	40.3 ± 2.5	28, 563, 294
Te_2F_{10}	54	—	—	—	9.45 ± 1.0	—	56
TeF_4	—	—	—	14.5 ± 1.0	—	—	110
TeF_6	—	—	-39	6.5 ± 0.4	—	—	198
TeCl_2	322	15.3 ± 1.5	—	—	—	—	25
TeCl_4	392	16.8 ± 1.5	—	24.3 ± 1.5	23.4 ± 1.5	27.5 ± 1.6	120
TeO_2	—	—	—	56.8 ± 3.0	—	61.7 ± 3.5	250
Th	(4850)	—	—	133.4 ± 2.5	—	137.6 ± 2.0	466
ThCl_4	922	36.5 ± 4.0	—	—	—	—	25
ThBr_4	857	34.5 ± 4.0	—	44.5 ± 4.0	—	—	25
ThI_4	837	31.5 ± 3.0	—	—	—	—	25
Ti	3285	101.7 ± 2.5	—	108.2 ± 1.0	—	112.1 ± 1.0	15, 52, 450
TiF_4	—	—	—	21.5 ± 0.5	—	22.9 ± 0.5	369
TiCl_3	(750)	(33.0)	283	(38.0)	—	(41.6)	—
TiCl_4	137	8.65 ± 0.5	—	—	9.92 ± 0.6	—	211
TiBr_4	233	10.5 ± 0.4	—	16.1 ± 0.6	13.1 ± 0.6	16.2 ± 0.6	369, 218, 197
TiI_2	—	—	1170	53.2 ± 6.0	—	56.3 ± 6.0	84
TiI_4	377	13.4 ± 1.0	—	20.5 ± 1.5	17.6 ± 1.5	21.6 ± 1.5	15
TiI	1460	39.7 ± 0.8	—	42.4 ± 0.6	41.9 ± 0.8	43.2 ± 0.8	120, 58
TIF	(700)	(27.7)	—	32.7 ± 1.0	—	34.0 ± 1.5	344
TiCl	816	24.75 ± 1.0	—	30.7 ± 1.0	28.9 ± 1.2	32.4 ± 1.0	344, 120
TiBr	825	24.7 ± 1.2	—	31.0 ± 1.0	29.5 ± 1.2	32.7 ± 1.2	344, 120
TiI	845	24.8 ± 1.5	—	30.3 ± 1.2	29.7 ± 1.5	—	344, 120
Ti_2SO_4	—	—	—	—	—	—	—
U	3930	99.7 ± 4.0	—	—	109.4 ± 3.0	115.2 ± 3.0	99
UF_4	1457	53.0 ± 4.0	—	—	—	—	399
UF_6	<51>	—	57	11.5 ± 0.1	7.25 ± 0.2	11.85 ± 0.1	160, 166, 179
UCl_4	789	33.8 ± 3.0	—	—	—	—	399
UBr_4	777	28.5 ± 3.0	—	—	—	—	399

Table D. Vapour pressures and
 $\log p = A \cdot T^{-1} + B \log T$

Substance	$\log p$ (mmHg)				Remarks	Temp. range (°K)	Ref.
	A	B	$C \times 10^3$	D			
<U ₄ >	-12,330	-3.52	—	26.62	—	298-m.p.	399
{U ₄ }	-9310	-5.53	—	28.57	—	m.p.-b.p.	399
<V>	-26,900	+0.33	-0.265	10.12	—	298-m.p.	99
{VF ₅ }	-2423	—	—	10.43	—	m.p.-b.p.	35
<VCl ₂ >	-9720	—	—	8.61	—	1183-1373	583
{VCl ₄ }	-2875	-6.07	—	25.56	—	298-m.p.	229
{VOCl ₃ }	-1921	—	—	7.70	—	298-b.p.	142, 63
{V ₂ O ₅ }	-7100	—	—	5.05	*	m.p.-1500	187
<W>	-44,000	+0.50	—	8.76	—	298-m.p.	99
{WF ₆ }	-1380	—	—	7.635	—	m.p.-b.p.	449, 120
<WCl ₄ > _α	-3996	—	—	9.615	—	458-503	236
<WCl ₄ > _β	-3588	—	—	8.795	—	503-554	236
{WCl ₄ }	-3253	—	—	8.195	—	555-600	236
<WCl ₅ >	-3670	—	—	9.50	—	413-m.p.	221
{WCl ₅ }	-2760	—	—	7.72	—	m.p.-b.p.	221
<WCl ₆ > _α	-4580	—	—	10.73	—	425-t.p.	130
<WCl ₆ > _β	-4080	—	—	9.73	—	t.p.-m.p.	130
{WCl ₆ }	-3050	—	—	7.87	—	m.p.-b.p.	221, 130
{WOF ₄ }	-3125	—	—	9.69	—	m.p.-b.p.	449
<WOF ₄ >	-3605	—	—	10.96	—	298-m.p.	449
<WO ₃ >	-24,600	—	—	15.63	—	1000-m.p.	250
<Y>	-22,230	-0.66	—	11.835	—	298-m.p.	—
{Y}	-22,280	-1.97	—	16.13	—	m.p.-b.p.	339
<Zn>	-6850	-0.755	—	11.24	—	298-m.p.	251, 120
{Zn}	-6620	-1.255	—	12.34	—	m.p.-b.p.	58
{ZnF ₂ }	-13,650	-5.03	—	26.90	—	m.p.-b.p.	25
{ZnCl ₂ }	-8415	-5.035	—	26.42	—	(693)-883	541
{Zn ₂ Cl ₄ }	-4700	—	—	5.89	—	(693)-883	541
{ZnBr ₂ }	-7785	-5.03	—	26.11	—	(671)-835	541
{Zn ₂ Br ₄ }	-5613	—	—	7.915	—	(671)-835	541
<ZnI ₂ >	-6450	-1.76	—	14.70	—	298-m.p.	177
<ZnS>	-13,980	—	—	8.98	—	970-1280	92
<Zr> _β	-31,820	-0.50	—	11.78	—	1125-m.p.	230
{Zr}	-30,300	—	—	9.38	—	m.p.-b.p.	—
<ZrF ₄ >	-14,700	-5.03	—	30.80	—	298-s.p.	324, 62
<ZrCl ₄ >	-5400	—	—	11.765	—	480-689	584
<ZrBr ₄ >	-6780	-1.76	-1.65	19.60	—	298-s.p.	120
<ZrI ₄ >	-7680	-2.164	-1.344	20.87	—	298-s.p.	120

* Apparent vapour pressures. V₂O₅ loses oxygen with increasing temperature.evaporation constants (contd.)
 $+ CT + D$ (mmHg)

Substance	b.pt. (°C)	L_v at b.pt. (kcal/mole)	sb.pt. (°C)	L_v at m.pt. or sb.pt.	L_v at 25°C (kcal/mole)	L_v at 25°C (kcal/mole)	Ref. and remarks
V	(3350)	—	—	119.9 ± 6.0	—	121.9 ± 7.0	51
VF ₅	48	11.1 ± 1.0	—	—	11.1 ± 1.0	—	35
VCl ₄	160	7.9 ± 0.4	—	—	9.5 ± 0.3	—	229
VOCl ₃	127	8.0 ± 0.6	—	—	9.2 ± 0.6	—	63, 142
V ₂ O ₅	dec.	—	—	(76.4)	(70.8)	—	187
W	(5500)	197.0 ± 5.0	—	205.0 ± 3.0	—	203.0 ± 3.0	99
WF ₆	17	6.35 ± 0.5	—	—	6.15 ± 0.4	—	120, 449
WCl ₄	—	—	—	—	—	—	—
WCl ₅	298	12.6 ± 3.0	—	16.8 ± 2.5	—	—	221
WCl ₆	338	13.9 ± 2.0	—	18.7 ± 3.0	—	—	221, 130
WOF ₄	186	14.25	—	16.5	—	—	449
WOCl ₄	220	11.5 ± 2.0	—	—	—	—	141, 221
WO ₃	—	—	—	(109.0)	—	(122.0)	250
Y	3300	87.8 ± 3.0	—	97.4 ± 2.0	—	101.5 ± 2.0	339
Y ₂ O ₃	—	—	—	—	—	—	—
Zn	907	27.3 ± 0.4	—	30.25 ± 0.4	29.5 ± 0.7	30.9 ± 0.7	251, 120
ZnF ₂	1500	44.0 ± 3.0	—	—	59.0 ± 5.0	—	25
ZnCl ₂	732	28.5 ± 3.0	—	37.1 ± 1.5	35.6 ± 2.0	38.0 ± 1.5	177, 120
ZnBr ₂	650	(23.5)	—	29.8 ± 1.5	—	31.3 ± 1.5	177
ZnI ₂	(730)	—	—	27.3 ± 1.5	—	28.6 ± 2.0	177
Zr	4400	—	—	143.4 ± 2.0	—	146.2 ± 2.5	230
ZrF ₄	—	—	908	55.5 ± 3.5	—	64.3 ± 4.0	324, 62
ZrCl ₄	[279]	—	334	24.7 ± 1.0	—	27.9 ± 1.5	584
ZrBr ₄	—	—	357	25.8 ± 2.5	—	29.3 ± 2.5	120
ZrI ₄	—	—	431	29.0 ± 2.5	—	33.3 ± 2.5	120
ZrO ₂	—	—	—	—	—	—	—

Table E. Standard Gibbs energies of reaction
 $\Delta G_T^\circ = A + BT \log T + CT$

Reaction	ΔG° in cal			$\pm$ kcal	Temp. range (°K)	Ref.
	A	B	C			
$2\langle \text{Ag}_2\text{S} \rangle_\alpha = 4\langle \text{Ag} \rangle + (\text{S}_2)$	44,800	—	-22.1	1	298-452	192
$2\langle \text{Ag}_2\text{S} \rangle_\beta = 4\langle \text{Ag} \rangle + (\text{S}_2)$	41,980	—	-16.52	1	452-1115	192
$2\langle \text{Ag}_2\text{S} \rangle = 4\langle \text{Ag} \rangle + (\text{S}_2)$	51,800	—	-24.33	1.5	1234-1500	192
$2\langle \text{Al} \rangle + (\text{Cl}_2) = 2\langle \text{AlCl} \rangle$	-21,360	11.75	-76.5	3	298-933	255
$2\langle \text{Al} \rangle + (\text{Cl}_2) = 2\langle \text{AlCl} \rangle$	-25,860	11.8	-71.9	3	933-2000	255
$\langle \text{Al} \rangle + \frac{1}{2}(\text{Cl}_2) = \langle \text{AlCl} \rangle$	-138,160	2.48	4.75	5	453-933	255
$\langle \text{Al} \rangle + \frac{1}{2}(\text{Cl}_2) = \langle \text{AlCl} \rangle$	-140,400	2.50	7.05	8	>933	255
$2\langle \text{Al} \rangle + 3(\text{Cl}_2) = (\text{Al}_2\text{Cl}_6)$	-304,440	4.95	4.23	9	453-933	255
$\langle \text{Al}_2\text{O}_3 \rangle = 2\langle \text{Al} \rangle + \frac{3}{2}(\text{O}_2)$	400,810	3.98	-87.64	3	298-923	—
$\langle \text{Al}_2\text{O}_3 \rangle = 2\langle \text{Al} \rangle + \frac{3}{2}(\text{O}_2)$	405,760	3.75	-92.22	4	923-1800	—
$2\langle \text{AlN} \rangle = 2\langle \text{Al} \rangle + (\text{N}_2)$	154,000	—	-44.5	16	298-923	—
$\langle \text{Al}_4\text{C}_3 \rangle = 4\langle \text{Al} \rangle + 3\langle \text{C} \rangle$	51,600	—	-10.0	2	298-932	655
$\langle \text{Al}_4\text{C}_3 \rangle = 4\langle \text{Al} \rangle + 3\langle \text{C} \rangle$	63,700	—	-23.0	2	932-2000	655
$\langle \text{Al}_2\text{Se}_3 \rangle + 4\langle \text{Al} \rangle = 3\langle \text{Al}_2\text{Se} \rangle$	168,300	—	-97.1	5	1300-1500	294
$2\langle \text{BaO} \rangle = 2\langle \text{Ba} \rangle + (\text{O}_2)$	271,600	—	-46.4	8	298-983	—
$2\langle \text{BaO} \rangle = 2\langle \text{Ba} \rangle + (\text{O}_2)$	278,000	—	-53.2	10	983-1600	—
$\langle \text{BaO} \rangle + \langle \text{SiO}_2 \rangle = \langle \text{BaSiO}_3 \rangle$	-26,800	—	+0.1	3	298-1600	193
$\langle \text{Ba}_3\text{N}_2 \rangle = 3\langle \text{Ba} \rangle + (\text{N}_2)$	87,000	—	-57.4	9	298-1000	—
$\langle \text{BeF}_2 \rangle = \langle \text{Be} \rangle + (\text{F}_2)$	243,200	15.4	-81.9	5	298-818	—
$\langle \text{BeF}_2 \rangle = \langle \text{Be} \rangle + (\text{F}_2)$	237,280	19.63	-87.0	5	818-1455	—
$\langle \text{BeF}_2 \rangle = \langle \text{Be} \rangle + (\text{F}_2)$	178,000	5.65	-2.0	5	>1557	—
$\langle \text{BeF}_2 \rangle + \langle \text{Be} \rangle = 2\langle \text{BeF} \rangle$	91,500	—	-44.3	—	1425-1675	498
$\langle \text{BeCl}_2 \rangle + \langle \text{Be} \rangle = 2\langle \text{BeCl} \rangle$	89,100	—	-39.4	5	1573-1723	496
$2\langle \text{BeO} \rangle = 2\langle \text{Be} \rangle + (\text{O}_2)$	286,900	3.32	-56.1	10	298-1557	—
$2\langle \text{BeO} \rangle = 2\langle \text{Be} \rangle + (\text{O}_2)$	291,900	3.32	-59.32	13	1557-2000	—
$\langle \text{Be}_3\text{N}_2 \rangle = 3\langle \text{Be} \rangle + (\text{N}_2)$	134,700	—	-40.6	12	298-1000	123
$\frac{2}{3}\langle \text{BiCl}_3 \rangle = \frac{2}{3}\langle \text{Bi} \rangle + (\text{Cl}_2)$	62,400	12.05	-66.6	3	298-503	255
$\frac{2}{3}\langle \text{BiCl}_3 \rangle = \frac{2}{3}\langle \text{Bi} \rangle + (\text{Cl}_2)$	63,570	17.5	-83.4	4	544-714	255
$\frac{2}{3}\langle \text{BiCl}_3 \rangle = \frac{2}{3}\langle \text{Bi} \rangle + (\text{Cl}_2)$	45,330	-3.96	+3.42	5	714-1500	255
$\langle \text{BiCl}_3 \rangle + 2\langle \text{Bi} \rangle = 3\langle \text{BiCl} \rangle$	72,000	—	-54.0	5	873-973	462
$\langle \text{BiBr}_3 \rangle + 2\langle \text{Bi} \rangle = 3\langle \text{BiBr} \rangle$	66,700	—	-54.0	5	870-980	462
$\langle \text{Bi}_2\text{S}_3 \rangle + 3(\text{H}_2) = 2\langle \text{Bi} \rangle + 3(\text{H}_2\text{S})$	24,500	27.73	-114.7	3	298-544	212
$\langle \text{Bi}_2\text{O}_3 \rangle = 2\langle \text{Bi} \rangle + \frac{3}{2}(\text{O}_2)$	-137,890	—	+63.43	1	773-1093	947
$\langle \text{C} \rangle + 2(\text{H}_2) = (\text{CH}_4)$	-16,520	+12.25	-15.62	1	298-1200	189
$\langle \text{C} \rangle + 2(\text{F}_2) = (\text{CF}_4)$	-220,000	—	+36.0	5	298-1500	—
$\langle \text{C} \rangle + 2(\text{Cl}_2) = (\text{CCl}_4)$	-26,250	-5.16	49.32	1	350-800	255
$\langle \text{C} \rangle + \frac{1}{2}(\text{O}_2) = (\text{CO})$	-26,700	—	-20.95	1	298-2500	191
$\langle \text{C} \rangle + (\text{O}_2) = (\text{CO}_2)$	-94,200	—	-0.2	1	298-2000	191
$\langle \text{C} \rangle + \frac{1}{2}(\text{S}_2) = (\text{CS})$	59,000	—	-22.75	7	1873-2073	361
$\langle \text{C} \rangle + (\text{S}_2) = (\text{CS}_2)$	-3,100	—	-1.73	1	298-1600	192
$2(\text{CO}) + (\text{S}_2) = 2(\text{COS})$	-45,720	—	+37.4	3	298-1500	192
graphite = diamond	+310	—	1.13	0.2	298-1500	198
$\langle \text{CaF}_2 \rangle_\alpha = \langle \text{Ca} \rangle + (\text{F}_2)$	293,300	7.7	-64.4	5	298-1123	—
$\langle \text{CaF}_2 \rangle_\beta = \langle \text{Ca} \rangle + (\text{F}_2)$	297,600	16.9	-98.35	6	1123-1424	—
$\langle \text{CaF}_2 \rangle_\gamma = \langle \text{Ca} \rangle + (\text{F}_2)$	285,000	—	-35.0	7	1424-1756	—
$\langle \text{CaCl}_2 \rangle = \langle \text{Ca} \rangle + (\text{Cl}_2)$	189,900	—	-34.0	3	298-1055	255
$\langle \text{CaCl}_2 \rangle = \langle \text{Ca} \rangle + (\text{Cl}_2)$	195,400	24.44	-112.6	5	1120-1900	255
$2\langle \text{CaO} \rangle = 2\langle \text{Ca} \rangle + (\text{O}_2)$	302,650	—	-47.32	3	298-1124	191
$2\langle \text{CaO} \rangle = 2\langle \text{Ca} \rangle + (\text{O}_2)$	307,100	—	-51.28	3	1124-1760	191
$2\langle \text{CaO} \rangle = 2\langle \text{Ca} \rangle + (\text{O}_2)$	380,200	—	-93.24	5	1760-2500	191

Table E. Standard Gibbs energies of reaction (contd.)
 $\Delta G_T^\circ = A + BT \log T + CT$

Reaction	ΔG° in cal			$\pm$ kcal	Temp. range (°K)	Ref.
	A	B	C			
$2\langle \text{CaS} \rangle = 2\langle \text{Ca} \rangle + (\text{S}_2)$	258,870	—	-45.62	2	298-673	192
$2\langle \text{CaS} \rangle = 2\langle \text{Ca} \rangle + (\text{S}_2)$	259,100	—	-45.92	2	673-1124	192
$2\langle \text{CaS} \rangle = 2\langle \text{Ca} \rangle + (\text{S}_2)$	263,560	—	-49.88	3	1124-1760	192
$2\langle \text{CaS} \rangle = 2\langle \text{Ca} \rangle + (\text{S}_2)$	336,710	—	-91.44	5	1760-2000	192
$\langle \text{Ca}_3\text{N}_2 \rangle = 3\langle \text{Ca} \rangle + (\text{N}_2)$	105,000	—	-50.0	11	298-1100	—
$\langle \text{Ca} \rangle + 2\langle \text{C} \rangle = \langle \text{CaC}_2 \rangle$	-13,600	—	-5.9	3	298-720	189
$\langle \text{Ca} \rangle + 2\langle \text{C} \rangle = \langle \text{CaC}_2 \rangle$	-11,620	—	-8.64	3	720-1123	189
$\langle \text{Ca} \rangle + 2\langle \text{C} \rangle = \langle \text{CaC}_2 \rangle$	-13,700	—	-6.80	3	1123-1963	189
$\langle \text{Ca} \rangle + 2\langle \text{C} \rangle = \langle \text{CaC}_2 \rangle$	-51,210	—	+12.3	5	1963-2200	—
$\langle \text{CaCO}_3 \rangle = \langle \text{CaO} \rangle + (\text{CO}_2)$	40,250	—	-34.4	1	449-1150	370
$\langle \text{Ca} \rangle + \langle \text{Si} \rangle = \langle \text{CaSi} \rangle$	-36,000	—	-0.5	4	298-1123	—
$\langle \text{Ca} \rangle + \langle \text{Si} \rangle = \langle \text{CaSi} \rangle$	-25,750	—	-6.58	5	1520-1717	—
$2\langle \text{Ca} \rangle + \langle \text{Si} \rangle = \langle \text{Ca}_2\text{Si} \rangle$	-42,600	—	-4.65	5	1200-1717	—
$\langle \text{CaO} \rangle + \langle \text{SiO}_2 \rangle = \langle \text{CaSiO}_3 \rangle_\alpha$	-21,300	—	+0.12	1	298-1483	193
$\langle \text{CaO} \rangle + \langle \text{SiO}_2 \rangle = \langle \text{CaSiO}_3 \rangle_\beta$	-19,900	—	-0.82	2	1483-1813	193
$2\langle \text{CaO} \rangle + \langle \text{SiO}_2 \rangle = \langle \text{Ca}_2\text{SiO}_4 \rangle$	-30,200	—	-1.2	2.5	298-1700	—
$2\langle \text{CdO} \rangle = 2\langle \text{Cd} \rangle + (\text{O}_2)$	174,500	—	-99.9	—	1242-1379	491
$\langle \text{CeCl}_3 \rangle = \langle \text{Ce} \rangle + \frac{3}{2}(\text{Cl}_2)$	255,200	18.4	-114.9	4	298-900	476
$\langle \text{CeO}_2 \rangle = \langle \text{Ce} \rangle + (\text{O}_2)$	260,900	5.0	-65.25	3	298-1000	—
$2\langle \text{CeS} \rangle = 2\langle \text{Ce} \rangle + (\text{S}_2)$	267,000	—	-40.0	10	298-2200	192
$2\langle \text{CeN} \rangle = 2\langle \text{Ce} \rangle + (\text{N}_2)$	156,000	—	-57.5	17	298-1000	123
$\langle \text{CeC} \rangle = \langle \text{Ce} \rangle + \langle \text{C} \rangle$	27,900	—	-8.2	—	815-940	465
$2(\text{CoCl}_3) = 2(\text{CoCl}_2) + (\text{Cl}_2)$	33,800	—	-36.3	2	900-1100	208
$\langle \text{CoCl}_3 \rangle = \langle \text{Co} \rangle + (\text{Cl}_2)$	78,700	6.9	-54.12	3	298-1000	—
$\langle \text{CoCl}_2 \rangle = \langle \text{Co} \rangle + (\text{Cl}_2)$	72,200	9.2	-54.52	4	1000-1323	—
$\langle \text{CoCl}_2 \rangle = \langle \text{Co} \rangle + (\text{Cl}_2)$	31,700	-13.8	+47.8	4	1323-1786	—
$\langle \text{CoF}_2 \rangle = \langle \text{Co} \rangle + (\text{F}_2)$	158,000	—	-33.7	6	298-1450	—
$2\langle \text{CoO} \rangle = 2\langle \text{Co} \rangle + (\text{O}_2)$	111,800	—	-33.8	2	298-1400	—
$\langle \text{Co}_3\text{O}_4 \rangle = 3\langle \text{CoO} \rangle + \frac{1}{2}(\text{O}_2)$	43,800	—	-35.4	3	298-1300	—
$\frac{1}{3}\langle \text{Co}_3\text{S}_4 \rangle = \frac{1}{3}\langle \text{Co} \rangle + (\text{S}_2)$	79,240	—	-39.81	2	298-1048	192
$\frac{1}{3}\langle \text{Co}_3\text{S}_4 \rangle + (\text{S}_2) = \frac{1}{3}\langle \text{Co}_3\text{S}_8 \rangle$	-51,640	—	+34.03	3	600-750	196
$\frac{1}{3}\langle \text{Co}_3\text{S}_8 \rangle = \langle \text{Co}_3\text{S}_4 \rangle + (\text{S}_2)$	50,160	—	-50.41	3	600-900	196
$\langle \text{Co}_3\text{C} \rangle = 2\langle \text{Co} \rangle + \langle \text{C} \rangle$	-3950	—	+2.08	5	298-1200	189
$\langle \text{CrCl}_2 \rangle = \langle \text{Cr} \rangle + (\text{Cl}_2)$	93,900	8.7	-55.0	3	298-1088	255
$\langle \text{CrCl}_2 \rangle = \langle \text{Cr} \rangle + (\text{Cl}_2)$	86,900	8.36	-47.5	3	1088-1577	255
$\langle \text{CrCl}_2 \rangle = \langle \text{Cr} \rangle + (\text{Cl}_2)$	27,700	-6.26	+37.0	5	1577-2100	255
$\frac{1}{2}\langle \text{CrCl}_3 \rangle = \frac{1}{2}\langle \text{Cr} \rangle + (\text{Cl}_2)$	87,400	7.42	-58.4	5	298-1200	255
$\langle \text{Cr}_2\text{O}_3 \rangle = 2\langle \text{Cr} \rangle + \frac{3}{2}(\text{O}_2)$	277,190	—	-53.25	2	298-2100	191
$2\langle \text{Cr}_2\text{N} \rangle = 4\langle \text{Cr} \rangle + (\text{N}_2)$	51,900	11.5	-66.0	5	298-1400	307
$4\langle \text{CrN} \rangle = 2\langle \text{Cr}_2\text{N} \rangle + (\text{N}_2)$	64,000	11.5	-83.2	5	298-1400	307
$\frac{1}{2}\langle \text{Cr}_2\text{C}_6 \rangle = \frac{1}{2}\langle \text{Cr} \rangle + \langle \text{C} \rangle$	+16,380	—	+1.54	3	298-1673	189
$\frac{1}{2}\langle \text{Cr}_2\text{C}_6 \rangle = \frac{1}{2}\langle \text{Cr}_2\text{C}_3 \rangle + \langle \text{C} \rangle$	10,050	—	2.85	3	298-1673	189
$\frac{1}{2}\langle \text{Cr}_2\text{C}_3 \rangle = \frac{1}{2}\langle \text{Cr}_2\text{C}_3 \rangle + \langle \text{C} \rangle$	3200	—	0.20	3	298-1673	189
$(\text{CuCl}) + \frac{1}{2}(\text{H}_2) = \langle \text{Cu} \rangle + (\text{HCl})$	-43,660	-4.17	+31.81	2	298-1300	25
$(\text{Cu}_2\text{Cl}_2) + \frac{1}{2}(\text{H}_2) = 3\langle \text{Cu} \rangle + 3(\text{HCl})$	-4500	—	-9.4	2	1300	25
$\langle \text{Cu}_2\text{O} \rangle = 2\langle \text{Cu} \rangle + \frac{1}{2}(\text{O}_2)$	40,500	3.92	-29.5	1	298-1356	—
— or —	39,800	—	-16.88	—	—	—
$\langle \text{Cu}_2\text{O} \rangle = 2\langle \text{Cu} \rangle + \frac{1}{2}(\text{O}_2)$	46,700	3.92	-34.1	1.5	1356-1503	—
$2\langle \text{CuO} \rangle = \langle \text{Cu}_2\text{O} \rangle + \frac{1}{2}(\text{O}_2)$	34,950	6.1	-44.3	0.5	298-1300	—
$\langle \text{Cu}_2\text{S} \rangle_\alpha = 2\langle \text{Cu} \rangle + (\text{S}_2)$	35,655	4.34	-27.31	1	298-376	307
$\langle \text{Cu}_2\text{S} \rangle_\beta = \langle \text{Cu}_2\text{S} \rangle_\alpha$	-490	-8.63	+23.53	1	—	307
$\langle \text{Cu}_2\text{S} \rangle_\gamma = 2\langle \text{Cu} \rangle + \frac{1}{2}(\text{S}_2)$	34,150	6.22	-28.74	1	623-1360	307

Table E. Standard Gibbs energies of reaction (contd.)
 $\Delta G_T^\circ = A + BT \log T + CT$

Reaction	ΔG° in cal			$\pm$ kcal	Temp. range (°K)	Ref.
	A	B	C			
$\langle \text{FeCl}_2 \rangle = \langle \text{Fe} \rangle_a + (\text{Cl}_2)$	82,770	6-98	-50-84	1	298-950	255
$\{\text{FeCl}_2\} = \langle \text{Fe} \rangle + (\text{Cl}_2)$	68,450	—	-15-22	1	950-1300	255
$\langle \text{FeCl}_2 \rangle = \langle \text{Fe} \rangle_a + (\text{Cl}_2)$	25,250	-23-0	+89-65	4	1300-1812	255
$2\langle \text{FeCl}_3 \rangle = 2\langle \text{FeCl}_2 \rangle + (\text{Cl}_2)$	25,900	—	-38-7	1	400-500	210
$2\langle \text{FeCl}_3 \rangle = \langle \text{Fe}_2\text{Cl}_6 \rangle$	-32,550	—	+31-65	1	778-978	210
$\langle \text{FeF}_2 \rangle = \langle \text{Fe} \rangle + (\text{F}_2)$	167,000	—	-31-8	6	298-1350	—
$2\langle \text{FeBr}_3 \rangle = 2\langle \text{FeBr}_2 \rangle + (\text{Br}_2)$	44,600	—	-33-7	2	750	421
$\langle \text{FeI}_2 \rangle = \langle \text{Fe} \rangle + (\text{I}_2)$	45,770	6-9	-51-2	5	298-867	—
$\{\text{FeI}_2\} = \langle \text{Fe} \rangle + (\text{I}_2)$	40,600	11-5	-58-6	6	867-1208	—
$2\langle \text{FeI}_3 \rangle = 2\langle \text{FeI}_2 \rangle + (\text{I}_2)$	32,000	—	-32-0	2	700-1000	421
$\langle \text{FeO} \rangle = \langle \text{Fe} \rangle + \frac{1}{2}(\text{O}_2)$	63,310	—	-15-62	3	298-1642	191
$\{\text{FeO}\} = \langle \text{Fe} \rangle + \frac{1}{2}(\text{O}_2)$	55,620	—	-10-83	3	1808-2000	191
$\langle \text{Fe}_3\text{O}_4 \rangle = 3\langle \text{FeO} \rangle + \frac{1}{2}(\text{O}_2)$	74,620	—	-29-9	3	298-1642	191
$3\langle \text{Fe}_3\text{O}_4 \rangle = 2\langle \text{Fe}_3\text{O}_4 \rangle + \frac{1}{2}(\text{O}_2)$	59,620	—	-33-62	8	298-1460	191
$\langle \text{Fe} \rangle + 2\langle \text{H}_2\text{O} \rangle = \langle \text{Fe}(\text{OH})_2 \rangle + (\text{H}_2)$	42,700	—	-7-31	2	1573-1733	436
$2\langle \text{FeS} \rangle_a = 2\langle \text{Fe} \rangle_a + (\text{S}_2)$	74,320	—	-31-18	1	298-412	192
$2\langle \text{FeS} \rangle_\beta = 2\langle \text{Fe} \rangle_\beta + (\text{S}_2)$	71,820	—	-25-12	1	412-1179	192
$2\langle \text{FeS} \rangle_\gamma = 2\langle \text{Fe} \rangle_\gamma + (\text{S}_2)$	72,140	—	-25-48	2	1179-1261	192
$2\langle \text{FeS}_2 \rangle = 2\langle \text{FeS} \rangle + (\text{S}_2)$	86,700	—	-90-0	3	600-1100	192
$\langle \text{Fe}_3\text{N} \rangle = 4\langle \text{Fe} \rangle + \frac{1}{2}(\text{N}_2)$	200	-11-62	24-85	—	298-950	123
$\langle \text{Fe}_3\text{P} \rangle = 3\langle \text{Fe} \rangle + \frac{1}{2}(\text{P}_2)$	51,000	—	-11-3	8	298-1439	191
$3\langle \text{FeCO}_3 \rangle = \langle \text{Fe}_3\text{O}_4 \rangle + 2\langle \text{CO}_2 \rangle + (\text{CO})$	52,800	—	-11-22	14	298-700	191
$2\langle \text{Fe} \rangle + (\text{O}_2) + \langle \text{SiO}_2 \rangle = \langle \text{Fe}_2\text{SiO}_4 \rangle$	-135,300	—	+34-4	3	298-1478	193
$2\langle \text{Fe} \rangle + (\text{O}_2) + 2\langle \text{TiO}_2 \rangle = 2\langle \text{FeTiO}_3 \rangle$	-129,220	—	+25-86	2	1173-1400	193
$2\langle \text{Fe} \rangle + (\text{O}_2) + 2\langle \text{Cr}_2\text{O}_3 \rangle = 2\langle \text{FeCr}_2\text{O}_4 \rangle$	-131,600	—	+24-2	3	1173-1700	193
$2\langle \text{Fe} \rangle + (\text{O}_2) + 2\langle \text{Al}_2\text{O}_3 \rangle = 2\langle \text{FeAl}_2\text{O}_4 \rangle$	-150,000	—	+41-8	8	1100-1400	193
$\langle \text{Ga}_2\text{O}_3 \rangle = 2\langle \text{Ga} \rangle + \frac{1}{2}(\text{O}_2)$	-259,340	—	+78-11	1	820-1073	945
$2\langle \text{GeI}_2 \rangle = \langle \text{Ge} \rangle + \langle \text{GeI}_4 \rangle$	32,500	18-4	-94-6	3	298-643	108
$\langle \text{GeO} \rangle = \frac{1}{2}\langle \text{Ge} \rangle + \frac{1}{2}\langle \text{GeO}_2 \rangle$	-54,600	-6-9	+62-0	4	298-860	108
$\langle \text{GeO}_2 \rangle = \langle \text{Ge} \rangle + (\text{O}_2)$	-137,330	—	+44-86	1	600-1173	—
$2\langle \text{HF} \rangle = (\text{H}_2) + (\text{F}_2)$	130,200	—	+1-9	—	298-2500	—
$\frac{1}{2}(\text{H}_2) + \frac{1}{2}(\text{Cl}_2) = (\text{HCl})$	-21,770	0-99	-5-22	0-6	298-2100	255
$(\text{H}_2) + \frac{1}{2}(\text{O}_2) = (\text{H}_2\text{O})$	-57,250	4-48	-2-21	0-3	298-2500	—
or	-58,900	—	13-1	1	298-2500	191
$(\text{H}_2) + \langle \text{S} \rangle = (\text{H}_2\text{S})$	-3320	11-72	-44-55	0-6	298-392	122
$2\langle \text{H}_2 \rangle + (\text{S}_2) = 2\langle \text{H}_2\text{S} \rangle$	-40,210	7-25	-1-21	0-7	298-1750	122
or	-43,160	—	23-61	1	298-1800	192
$\frac{1}{2}(\text{N}_2) + \frac{1}{2}(\text{H}_2) = (\text{NH}_3)$	-10,400	7-1	3-79	0-5	298-1000	123
or	-12,050	—	+26-7	2	298-1000	184
$\langle \text{In}_2\text{O}_3 \rangle + 3(\text{H}_2) = 2\langle \text{In} \rangle + 3\langle \text{H}_2\text{O} \rangle$	44,960	3-35	-49-63	3	430-1123	238
$\langle \text{In}_2\text{O}_3 \rangle = 2\langle \text{In} \rangle + \frac{1}{2}(\text{O}_2)$	-215,550	—	+72-63	1	800-1123	946
$\langle \text{InS} \rangle + (\text{H}_2) = \langle \text{In} \rangle + (\text{H}_2\text{S})$	41,900	2-75	-41-4	3	298-1000	335
$\langle \text{IrO}_2 \rangle = \langle \text{Ir} \rangle + (\text{O}_2)$	52,200	12-65	-77-25	4	298-1366	274
$\langle \text{Ir} \rangle + \frac{1}{2}(\text{O}_2) = \langle \text{IrO}_3 \rangle$	4150	—	+10-8	—	1473-1673	423
$\frac{2}{3}\langle \text{Ir}_2\text{S}_3 \rangle = \frac{4}{3}\langle \text{Ir} \rangle + (\text{S}_2)$	64,500	—	-44-66	5	1000-1600	192
$\langle \text{KCl} \rangle = \langle \text{K} \rangle + \frac{1}{2}(\text{Cl}_2)$	104,900	—	-24-0	1	298-1043	255
$\{\text{KCl}\} = (\text{K}) + \frac{1}{2}(\text{Cl}_2)$	116,600	—	-35-2	1-5	1043-1680	255
$\langle \text{KCl} \rangle = (\text{K}) + \frac{1}{2}(\text{Cl}_2)$	66,000	-16-1	46-84	2	1680-2300	255
$\langle \text{K}_2\text{O} \rangle = 2\langle \text{K} \rangle + \frac{1}{2}(\text{O}_2)$	86,600	4-6	-44-6	3	298-	—

Table E. Standard Gibbs energies of reaction (contd.)
 $\Delta G_T^\circ = A + BT \log T + CT$

Reaction	ΔG° in cal			$\pm$ kcal	Temp. range (°K)	Ref.
	A	B	C			
$\langle \text{La}_2\text{O}_3 \rangle = 2\langle \text{La} \rangle + \frac{1}{2}(\text{O}_2)$	447,200	9-2	-96-9	4	298-1000	—
$\langle \text{LaN} \rangle = \langle \text{La} \rangle + \frac{1}{2}(\text{N}_2)$	72,100	—	-25-0	9	298-1000	123
$2\langle \text{LiOH} \rangle = \langle \text{Li}_2\text{O} \rangle + (\text{H}_2\text{O})$	34,940	—	-25-98	3	648-795	48
$\{\text{Li}_2\text{CO}_3\} = \{\text{Li}_2\text{O}\} + (\text{CO}_2)$	77,950	—	-69-0	—	m.p.-1125	532
$\langle \text{MgF}_2 \rangle = \langle \text{Mg} \rangle + (\text{F}_2)$	267,200	—	-40-2	3	298-923	—
$\langle \text{MgF}_2 \rangle = \langle \text{Mg} \rangle + (\text{F}_2)$	269,300	—	-42-5	3	923-1276	—
$\langle \text{MgCl}_2 \rangle = \langle \text{Mg} \rangle + (\text{Cl}_2)$	154,440	9-88	-68-18	1	298-923	255
$\{\text{MgCl}_2\} = \langle \text{Mg} \rangle + (\text{Cl}_2)$	147,850	13-58	-72-77	1-5	987-1376	255
$\{\text{MgCl}_2\} = (\text{Mg}) + (\text{Cl}_2)$	184,100	20-71	-121-52	1-5	1380-1691	255
$\langle \text{MgO} \rangle = \langle \text{Mg} \rangle + \frac{1}{2}(\text{O}_2)$	134,500	-2-29	-17-94	5	1691-2000	255
$\langle \text{MgO} \rangle = \langle \text{Mg} \rangle + \frac{1}{2}(\text{O}_2)$	144,350	2-95	-33-95	1-5	298-923	191a
$\langle \text{MgO} \rangle = \langle \text{Mg} \rangle + \frac{1}{2}(\text{O}_2)$	145,350	0-24	-26-95	1-5	923-1380	191a
$\langle \text{MgO} \rangle = \langle \text{Mg} \rangle + \frac{1}{2}(\text{O}_2)$	181,600	7-37	-75-7	3	1380-2500	191a
$\langle \text{Mg}(\text{OH})_2 \rangle = \langle \text{MgO} \rangle + (\text{H}_2\text{O})$	11,000	—	-24-0	—	653-923	420
$\langle \text{MgS} \rangle = \langle \text{Mg} \rangle + \frac{1}{2}(\text{S}_2)$	99,650	—	-22-8	5	298-923	192
$\langle \text{MgS} \rangle = \langle \text{Mg} \rangle + \frac{1}{2}(\text{S}_2)$	101,800	—	-25-65	5	923-1380	192
$\langle \text{MgS} \rangle = \langle \text{Mg} \rangle + \frac{1}{2}(\text{S}_2)$	134,350	—	-48-75	5	1380-2000	192
$\langle \text{MgS} \rangle = (\text{Mg}) + \frac{1}{2}(\text{S}_2)$	109,600	—	-47-41	3	298-823	184
$\langle \text{Mg}_3\text{N}_2 \rangle_a = 3\langle \text{Mg} \rangle + (\text{N}_2)$	115,970	—	-54-30	3	923-1061	184
$\langle \text{Mg}_3\text{N}_2 \rangle_\beta = 3\langle \text{Mg} \rangle + (\text{N}_2)$	115,750	—	-54-09	3	1061-1300	184
$\langle \text{Mg}_3\text{N}_2 \rangle_\gamma = 3\langle \text{Mg} \rangle + (\text{N}_2)$	28,100	—	-40-6	4	298-1000	191
$\langle \text{MgCO}_3 \rangle = \langle \text{MgO} \rangle + (\text{CO}_2)$	-8900	—	+1-1	1	298-1600	193
$\langle \text{MgO} \rangle + \langle \text{SiO}_2 \rangle = \langle \text{Mg}_2\text{SiO}_4 \rangle$	-15,120	—	0-0	2	298-1700	193
$2\langle \text{MgO} \rangle + \langle \text{SiO}_2 \rangle = \langle \text{Mg}_2\text{SiO}_4 \rangle$	—	—	—	—	—	—
$\langle \text{MnCl}_2 \rangle = \langle \text{Mn} \rangle + (\text{Cl}_2)$	116,300	8-37	-56-0	1	298-923	—
$\{\text{MnCl}_2\} = \langle \text{Mn} \rangle + (\text{Cl}_2)$	107,970	9-11	-49-15	1	993-1373	—
$\{\text{MnCl}_2\} = \langle \text{Mn} \rangle + (\text{Cl}_2)$	105,930	4-07	-31-84	1-5	1400-1504	—
$\langle \text{MnCl}_2 \rangle = \langle \text{Mn} \rangle + (\text{Cl}_2)$	53,450	-16-4	+68-2	2	1517-	—
$\langle \text{MnO} \rangle = \langle \text{Mn} \rangle + \frac{1}{2}(\text{O}_2)$	91,950	—	-17-4	3	298-1500	191
$\langle \text{MnO} \rangle = \langle \text{Mn} \rangle + \frac{1}{2}(\text{O}_2)$	95,400	—	-19-7	3	1500-2050	191
$\langle \text{MnS} \rangle = \langle \text{Mn} \rangle + \frac{1}{2}(\text{S}_2)$	64,000	—	-15-32	1-5	298-1000	192
$\langle \text{MnS} \rangle = \langle \text{Mn} \rangle + \frac{1}{2}(\text{S}_2)$	64,540	—	-15-86	1-5	1000-1374	192
$\langle \text{MnS} \rangle = \langle \text{Mn} \rangle + \frac{1}{2}(\text{S}_2)$	65,510	—	-16-56	1-5	1410-1517	192
$\langle \text{MnS} \rangle = \langle \text{Mn} \rangle + \frac{1}{2}(\text{S}_2)$	69,010	—	-18-86	2	1517-1803	192
$\langle \text{MnS} \rangle = \langle \text{Mn} \rangle + \frac{1}{2}(\text{S}_2)$	62,770	—	-15-40	2	1803-2000	192
$\langle \text{Mn}_3\text{C} \rangle = 3\langle \text{Mn} \rangle + \langle \text{C} \rangle$	3330	—	+0-26	3	298-1010	189
$\langle \text{MnSiO}_3 \rangle = \langle \text{MnO} \rangle + \langle \text{SiO}_2 \rangle$	5920	—	-3-0	4	298-1600	193
$\langle \text{MoI}_2 \rangle = \langle \text{Mo} \rangle + 2(\text{I})$	25,000	—	9-5	2	1050-1500	278
$\langle \text{MoO}_2 \rangle = \langle \text{Mo} \rangle + (\text{O}_2)$	140,500	4-6	-56-8	6	298-1300	307
$\langle \text{MoO}_2 \rangle = \langle \text{MoO}_2 \rangle + \frac{1}{2}(\text{O}_2)$	38,700	—	-19-5	3	298-1300	307
$2\langle \text{Mo}_2\text{N} \rangle = 4\langle \text{Mo} \rangle + (\text{N}_2)$	34,400	9-2	-57-9	8	298-1300	307
$\frac{2}{3}\langle \text{Mo}_2\text{S}_3 \rangle = \frac{4}{3}\langle \text{Mo} \rangle + (\text{S}_2)$	85,700	—	-36-41	2	1123-1473	626
$\langle \text{NaF} \rangle = \langle \text{Na} \rangle + \frac{1}{2}(\text{F}_2)$	137,000	—	-24-9	3	271-1156	—
$\langle \text{NaCl} \rangle = \langle \text{Na} \rangle + \frac{1}{2}(\text{Cl}_2)$	99,000	—	-23-6	1-5	298-1073	255
$\langle \text{NaCl} \rangle = (\text{Na}) + \frac{1}{2}(\text{Cl}_2)$	114,300	—	-35-8	2	1183-1738	—
$\langle \text{Na}_2\text{S} \rangle = 2\langle \text{Na} \rangle + \frac{1}{2}(\text{S}_2)$	105,250	—	-31-45	5	371-1187	192
$\langle \text{Na}_2\text{SiO}_3 \rangle = \langle \text{Na}_2\text{O} \rangle + \langle \text{SiO}_2 \rangle$	55,550	—	+1-40	8	298-1361	193
	43,080	—	10-55	10	1361-1600	193
$2\langle \text{NbCl}_4 \rangle = \langle \text{NbCl}_3 \rangle + (\text{NbCl}_5)$	28,300	—	-47-0	1	475-590	206
$2\langle \text{NbO} \rangle = 2\langle \text{Nb} \rangle + (\text{O}_2)$	198,700	11-5	-77-0	4	298-	—
$2\langle \text{NbO}_2 \rangle = 2\langle \text{NbO} \rangle + (\text{O}_2)$	185,100	11-5	-79-5	4	298-	—
$2\langle \text{Nb}_2\text{O}_5 \rangle = 4\langle \text{NbO}_2 \rangle + (\text{O}_2)$	149,700	11-5	-68-9	5	298-	—
$\langle \text{NbC} \rangle = \langle \text{Nb} \rangle + \langle \text{C} \rangle$	31,100	—	-0-4	—	1180-1370	656

Table E. Standard Gibbs energies of reaction (contd.)
 $\Delta G_T^\circ = A + BT \log T + CT$

Reaction	ΔG° in cal			$\pm$ kcal	Temp. range (°K)	Ref.
	A	B	C			
$\langle \text{NdCl}_3 \rangle + (\text{H}_2\text{O}) = \langle \text{NdOCl} \rangle + 2(\text{HCl})$	20,910	—	-30.31	3	785	137
$\langle \text{NiCl}_2 \rangle + (\text{H}_2) = \langle \text{Ni} \rangle + 2(\text{HCl})$	29,075	6.15	-58.53	0.8	298-1260	30
$\langle \text{NiO} \rangle = \langle \text{Ni} \rangle + \frac{1}{2}(\text{O}_2)$	56,010	—	-20.37	2	298-1725	191
$\langle \text{NiO} \rangle = \langle \text{Ni} \rangle + \frac{1}{2}(\text{O}_2)$	62,650	—	-25.98	3	1725-2200	191
$\langle \text{Ni}_3\text{C} \rangle = 3\langle \text{Ni} \rangle + \langle \text{C} \rangle$	-8110	—	+1.70	3	298-1000	189
$\langle \text{Ni}_3\text{S}_2 \rangle = 3\langle \text{Ni} \rangle + (\text{S}_2)$	79,240	—	-39.01	2	650-800	196
$2\langle \text{NiS} \rangle = 2\langle \text{Ni} \rangle + (\text{S}_2)$	69,960	—	-34.41	3	670-850	196
$(\text{P}_4) = 2(\text{P}_2)$	53,860	4.35	-50.05	3	298-1200	237
$\langle \text{PbCl}_3 \rangle = \langle \text{PbCl} \rangle + (\text{Cl}_2)$	22,850	4.37	-56.22	4	298-1000	237
$\langle \text{PbCl}_2 \rangle = \langle \text{Pb} \rangle + (\text{Cl}_2)$	85,000	—	-34.3	2	298-771	255
$\langle \text{PbCl}_2 \rangle = \langle \text{Pb} \rangle + (\text{Cl}_2)$	83,600	14.12	-73.3	3	771-1224	255
$\langle \text{PbCl}_2 \rangle = \langle \text{Pb} \rangle + (\text{Cl}_2)$	37,800	-16.3	+57.92	3	1224-1500	255
$2\langle \text{PbO} \rangle = 2\langle \text{Pb} \rangle + (\text{O}_2)$	105,700	6.9	-68.86	4	298-600	—
$2\langle \text{PbO} \rangle = 2\langle \text{Pb} \rangle + (\text{O}_2)$	107,500	—	-52.6	4	600-760	—
$2\langle \text{PbO} \rangle = 2\langle \text{Pb} \rangle + (\text{O}_2)$	106,600	—	-51.4	4	760-1150	—
$2\langle \text{PbS} \rangle = 2\langle \text{Pb} \rangle + (\text{S}_2)$	72,710	—	-34.17	3	298-600	192
$2\langle \text{PbS} \rangle = 2\langle \text{Pb} \rangle + (\text{S}_2)$	75,160	—	-38.25	3	600-1380	192
$\langle \text{PbSe} \rangle = \langle \text{Pb} \rangle + \langle \text{Se} \rangle$	25,340	—	-3.8	2	473-573	481
$\langle \text{PdCl}_2 \rangle = \langle \text{Pd} \rangle + (\text{Cl}_2)$	—	—	—	—	—	—
$\langle \text{PdCl}_2 \rangle = \langle \text{Pd} \rangle + (\text{Cl}_2)$	—	—	—	—	—	—
$\langle \text{PdO} \rangle = \langle \text{Pd} \rangle + \frac{1}{2}(\text{O}_2)$	22,400	5.75	-36.9	2	298-1133	274
$\langle \text{PrCl}_3 \rangle + (\text{H}_2\text{O}) = \langle \text{PrOCl} \rangle + 2(\text{HCl})$	21,530	—	-30.07	3	785	137
$(\text{PtO}_2) = \langle \text{Pt} \rangle + (\text{O}_2)$	-39,270	—	+0.93	2	1373-1823	423
$2\langle \text{PtS} \rangle = 2\langle \text{Pt} \rangle + (\text{S}_2)$	66,100	—	-43.6	5	1000-1700	192
$2\langle \text{PtS}_2 \rangle = 2\langle \text{PtS} \rangle + (\text{S}_2)$	43,750	—	-43.8	5	700-1100	192
$\langle \text{ReS}_2 \rangle = \langle \text{Re} \rangle + (\text{S}_2)$	64,200	9.2	-68.6	5	298-1500	—
$(\text{RhO}_2) = \langle \text{Rh} \rangle + (\text{O}_2)$	-45,140	—	+4.94	1	1473-1773	423
$(\text{RuCl}_4) = \langle \text{Ru} \rangle + 2(\text{Cl}_2)$	21,650	-4.83	-8.4	2	298-1400	434
$\langle \text{RuCl}_3 \rangle = \langle \text{Ru} \rangle + \frac{1}{2}(\text{Cl}_2)$	61,800	10.35	-86.5	—	—	434
$\langle \text{RuO}_2 \rangle = \langle \text{Ru} \rangle + (\text{O}_2)$	73,600	6.9	-62.4	—	298-1850	605
$(\text{S}_2) = \frac{1}{2}(\text{S}_4)$	-14,200	—	+15.94	2.5	298-1300	21
$(\text{S}_2) = \frac{1}{2}(\text{S}_6)$	-21,240	—	+23.1	1	298-1300	21
$(\text{S}_2) = \frac{1}{2}(\text{S}_8)$	-23,040	—	+25.3	2	298-1300	21
$(\text{S}_2) = 2(\text{S})$	+77,250	—	-29.7	10	298-2000	221
$2(\text{SO}) = (\text{S}_2) + (\text{O}_2)$	30,800	—	+2.8	7	298-2000	—
$(\text{S}_2) + 2(\text{O}_2) = 2(\text{SO}_2)$	-173,240	—	34.62	1	298-2000	192
$(\text{S}_2) + 3(\text{O}_2) = 2(\text{SO}_3)$	-218,440	—	77.34	3	318-1800	192
$\langle \text{Sb}_2\text{O}_3 \rangle = 2\langle \text{Sb} \rangle + \frac{1}{2}(\text{O}_2)$	-164,340	—	+57.62	1	773-900	947
$(\text{SiCl}_4) = \langle \text{Si} \rangle + 2(\text{Cl}_2)$	155,600	3.64	-43.9	3	298-1000	—
$\langle \text{Si} \rangle + (\text{SiCl}_4) = 2(\text{SiCl}_2)$	83,000	12.0	-89.4	3	298-1800	209
$\langle \text{SiO}_2 \rangle + \langle \text{Si} \rangle = 2(\text{SiO})$	169,600	12.9	-124.3	3	298-1700	221
$\langle \text{SiO}_2 \rangle = \langle \text{Si} \rangle + (\text{O}_2)$	215,600	—	-41.5	3	700-1700	—
$\langle \text{SiO}_2 \rangle = \langle \text{Si} \rangle + (\text{O}_2)$	227,700	—	-48.7	3	1700-2000	—
$\langle \text{Si}_3\text{N}_4 \rangle = 3\langle \text{Si} \rangle + 2(\text{N}_2)$	177,000	5.76	-96.3	6	298-1686	590

Table E. Standard Gibbs energies of reaction (contd.)
 $\Delta G_T^\circ = A + BT \log T + CT$

Reaction	ΔG° in cal			$\pm$ kcal	Temp. range (°K)	Ref.
	A	B	C			
$\langle \text{Si}_3\text{N}_4 \rangle = 3\langle \text{Si} \rangle + 2(\text{N}_2)$	209,000	—	-96.8	1	1686-1973	590
$\langle \text{SiC} \rangle = \langle \text{Si} \rangle + \langle \text{C} \rangle$	14,000	1.3	-5.68	2.5	298-1686	—
$\langle \text{SiC} \rangle = \langle \text{Si} \rangle + \langle \text{C} \rangle$	27,100	2.73	-18.1	2	1686-2000	502, 468, 189, 948
$(\text{SiS}) = \langle \text{Si} \rangle + \frac{1}{2}(\text{S}_2)$	12,740	—	-19.18	2	863-1680	—
$\langle \text{SnCl}_2 \rangle = \langle \text{Sn} \rangle + (\text{Cl}_2)$	79,600	—	-28.3	4	520-925	—
$\langle \text{SnCl}_4 \rangle = \langle \text{Sn} \rangle + 2(\text{Cl}_2)$	122,500	—	-36.0	2.5	500-1200	—
$\langle \text{SnO}_2 \rangle = \langle \text{Sn} \rangle + (\text{O}_2)$	140,180	—	-51.52	1	770-980	433
$(\text{TaCl}_5) = (\text{TaCl}_4) + \frac{1}{2}(\text{Cl}_2)$	33,600	—	-31.3	—	—	615
$2\langle \text{TaCl}_4 \rangle = \langle \text{TaCl}_3 \rangle + (\text{TaCl}_5)$	27,000	—	-48.3	—	—	615
$3\langle \text{TaCl}_3 \rangle = 2\langle \text{TaCl}_4 \rangle + (\text{TaCl}_5)$	33,400	—	-32.3	—	—	615
$\langle \text{Ta}_2\text{O}_5 \rangle + 3\langle \text{TaCl}_3 \rangle = 5\langle \text{TaOCl}_3 \rangle$	99,000	—	-95.0	—	854-1026	606
$\langle \text{Ta}_2\text{O}_5 \rangle = 2\langle \text{Ta} \rangle + \frac{5}{2}(\text{O}_2)$	491,000	20.7	-168.4	5	298-2000	307
$2\langle \text{Ta}_2\text{N} \rangle = 2\langle \text{Ta} \rangle + (\text{N}_2)$	117,800	13.8	-79.7	7	298-2240	307
$\langle \text{TaC} \rangle = \langle \text{Ta} \rangle + \langle \text{C} \rangle$	34,900	—	-0.5	—	1250-1400	656
$\langle \text{TeO}_2 \rangle = \langle \text{Te} \rangle + (\text{O}_2)$	-75,120	—	+41.18	1	773-973	947
$\langle \text{ThO}_2 \rangle = \langle \text{Th} \rangle + (\text{O}_2)$	293,400	1.61	-47.7	5	298-1800	—
$\langle \text{Th}(\text{SO}_4)_2 \rangle = \langle \text{Th} \rangle + (\text{S}_2) + 4(\text{O}_2)$	645,150	33.2	-331.05	—	—	569
$\langle \text{Th}_3\text{N}_4 \rangle = 3\langle \text{Th} \rangle + 2(\text{N}_2)$	310,400	—	-89.7	20	298-2000	123
$\langle \text{ThC}_2 \rangle = \langle \text{Th} \rangle + 2\langle \text{C} \rangle$	45,000	—	-2.6	10	298-2300	—
$2\langle \text{TiCl}_3 \rangle = \langle \text{TiCl}_2 \rangle + (\text{TiCl}_4)$	40,500	18.4	-96.4	4	298-1000	—
$(\text{TiCl}_4) = \langle \text{Ti} \rangle + 2(\text{Cl}_2)$	180,700	1.8	-34.65	3	298-1700	—
$2\langle \text{TiH}_2 \rangle = \langle \text{Ti} \rangle + (\text{TiH}_4)$	50,600	13.8	-76.5	8	298-1000	84
$\langle \text{TiO} \rangle = \langle \text{Ti} \rangle + \frac{1}{2}(\text{O}_2)$	122,300	—	-21.3	4	600-2000	149
$\langle \text{Ti}_2\text{O}_3 \rangle = 2\langle \text{TiO} \rangle + \frac{1}{2}(\text{O}_2)$	114,150	—	-19.05	4	298-2000	149
$2\langle \text{Ti}_3\text{O}_5 \rangle = 3\langle \text{Ti}_2\text{O}_3 \rangle + \frac{1}{2}(\text{O}_2)$	88,500	—	-19.7	3	700-2000	149
$3\langle \text{TiO}_2 \rangle = \langle \text{Ti}_2\text{O}_3 \rangle + \frac{1}{2}(\text{O}_2)$	73,000	—	-23.0	3	298-2123	149
$2\langle \text{TiN} \rangle = 2\langle \text{Ti} \rangle + (\text{N}_2)$	160,500	—	-44.4	4	298-1155	184
$2\langle \text{TiN} \rangle = 2\langle \text{Ti} \rangle + (\text{N}_2)$	161,700	—	-45.54	4	1155-1500	184
$\langle \text{TiC} \rangle = \langle \text{Ti} \rangle + \langle \text{C} \rangle$	43,750	—	-2.41	3	298-1155	189
$\langle \text{TiC} \rangle = \langle \text{Ti} \rangle + \langle \text{C} \rangle$	44,600	—	-3.16	3	1155-2000	189
$\langle \text{UF}_4 \rangle = \langle \text{U} \rangle + 2(\text{F}_2)$	448,500	—	-67.4	—	298-1309	399
$\langle \text{UF}_4 \rangle = \langle \text{U} \rangle + 2(\text{F}_2)$	433,100	—	-55.6	—	1309-1405	399
$\langle \text{UF}_4 \rangle = \langle \text{U} \rangle + 2(\text{F}_2)$	—	—	—	—	1405-1730	399
$\langle \text{UF}_6 \rangle = \langle \text{UF}_4 \rangle + (\text{F}_2)$	73,000	—	-30.4	—	298-337	399
$(\text{UF}_6) = \langle \text{UF}_4 \rangle + (\text{F}_2)$	62,300	—	+2.8	—	298-1309	399
$(\text{UF}_6) = \langle \text{UF}_4 \rangle + (\text{F}_2)$	74,900	—	-7.1	—	1309-1730	399
$\langle \text{UCl}_4 \rangle = \langle \text{U} \rangle + 2(\text{Cl}_2)$	253,100	14.3	-112.8	—	298-861	399
$\langle \text{UCl}_4 \rangle = \langle \text{U} \rangle + 2(\text{Cl}_2)$	236,700	—	-52.0	—	861-1060	399
$\langle \text{UCl}_6 \rangle = \langle \text{UCl}_4 \rangle + (\text{Cl}_2)$	-2600	—	+1.5	—	450-900	399
$\langle \text{UBr}_4 \rangle = \langle \text{U} \rangle + 2(\text{Br}_2)$	211,000	—	-70.9	—	298-792	399
$\langle \text{UBr}_4 \rangle = \langle \text{U} \rangle + 2(\text{Br}_2)$	194,000	—	-49.2	—	792-1050	399
$\langle \text{UO}_2 \rangle = \langle \text{U} \rangle + (\text{O}_2)$	258,000	—	-40.0	—	298-1405	399
$\langle \text{UO}_2 \rangle = \langle \text{U} \rangle + (\text{O}_2)$	269,700	15.4	-97.0	—	1405-2000	399
$2\langle \text{U}_4\text{O}_9 \rangle = 8\langle \text{UO}_2 \rangle + (\text{O}_2)$	86,700	23.0	-105.3	—	298-1395	399
$\langle \text{U}_3\text{O}_8 \rangle = 3\langle \text{UO}_2 \rangle + (\text{O}_2)$	75,800	—	-34.0	—	298-1395	399
$\langle \text{UN} \rangle = \langle \text{U} \rangle + \frac{1}{2}(\text{N}_2)$	70,000	—	-20.5	—	298-1405	399
$\langle \text{UN} \rangle = \langle \text{U} \rangle + \frac{1}{2}(\text{N}_2)$	71,200	—	-21.5	—	1405-2000	399
$\langle \text{UC} \rangle = \langle \text{U} \rangle + \langle \text{C} \rangle$	21,600	—	+1.5	1.5	298-m.p.	—

Table E. Standard Gibbs energies of reaction (contd.)

$$\Delta G_T^\circ = A + BT \log T + CT$$

Reaction	ΔG° in cal			$\pm$ kcal	Temp. range (°K)	Ref.
	A	B	C			
$\langle UC \rangle = \langle U \rangle + \langle C \rangle$	24,600	—	-1.2	1.5	m.p.-2500	—
$\langle UC_2 \rangle = \langle U \rangle + 2\langle C \rangle$	27,700	—	-2.6	2	m.p.-2050	—
$2\langle VCl_3 \rangle = \langle VCl_2 \rangle + \langle VCl_4 \rangle$	38,000	—	-39.6	—	698-928	581
$2\langle VBr_3 \rangle + \langle Br_2 \rangle = 2\langle VBr_4 \rangle$	19,200	—	-32.9	—	523-873	617
$2\langle VO \rangle = 2\langle V \rangle + \langle O_2 \rangle$	205,900	—	-35.9	6	900-1800	4
$2\langle V_2O_3 \rangle = 4\langle VO \rangle + \langle O_2 \rangle$	175,300	—	-40.5	5	823-1385	4
$4\langle VO_2 \rangle = 2\langle V_2O_3 \rangle + \langle O_2 \rangle$	102,800	—	-33.5	4	1020-1180	4
$2\langle V_2O_5 \rangle = 4\langle VO_2 \rangle + \langle O_2 \rangle$	64,480	—	-45.6	3	298-943	4
$2\langle V_2O_5 \rangle = 4\langle VO_2 \rangle + \langle O_2 \rangle$	84,300	—	-40.3	4	943-1800	4
$\langle VC \rangle = \langle V \rangle + \langle C \rangle$	24,100	—	-1.5	—	1180-1370	656
$\langle WO_2 \rangle = \langle W \rangle + \langle O_2 \rangle$	138,500	—	-36.6	5	298-1500	—
$\langle WO_3 \rangle = \langle W \rangle + 1\frac{1}{2}\langle O_2 \rangle$	201,500	10.2	-91.7	5	298-1400	191a
$\langle WS_2 \rangle = \langle W \rangle + \langle S_2 \rangle$	62,360	—	-23.0	10	298-1400	192
$\langle WC \rangle = \langle W \rangle + \langle C \rangle$	9000	—	-0.4	3	298-2000	—
$\langle ZnCl_2 \rangle = \langle Zn \rangle + \langle Cl_2 \rangle$	101,385	12.85	-75.45	3	298-586	255
$\langle ZnCl_2 \rangle = \langle Zn \rangle + \langle Cl_2 \rangle$	93,950	—	-27.35	5	586-1005	255
$\langle ZnCl_2 \rangle = \langle Zn \rangle + \langle Cl_2 \rangle$	93,800	9.44	-38.6	5	1180-1800	—
$\langle ZnO \rangle = \langle Zn \rangle + \frac{1}{2}\langle O_2 \rangle$	84,100	6.9	-44.14	1.5	298-693	—
$\langle ZnO \rangle = \langle Zn \rangle + \frac{1}{2}\langle O_2 \rangle$	115,420	10.35	-82.38	2	1170-2000	—
$\langle ZnS \rangle = \langle Zn \rangle + \frac{1}{2}\langle S_2 \rangle$	63,650	4.6	-36.68	4	298-693	—
$\langle ZnS \rangle = \langle Zn \rangle + \frac{1}{2}\langle S_2 \rangle$	94,970	8.05	-74.92	5	1120-2000	—
$2\langle ZnO \rangle + \langle SiO_2 \rangle = \langle Zn_2SiO_4 \rangle$	-7130	—	+0.23	2	300-1300	135
$\langle ZrCl_4 \rangle = \langle Zr \rangle + 2\langle Cl_2 \rangle$	-233,250	—	+69.46	1	298-700	—
$\langle ZrO_2 \rangle_\alpha = \langle Zr \rangle_\alpha + \langle O_2 \rangle$	259,940	4.33	-59.12	4	298-1143	307
$\langle ZrO_2 \rangle_\beta = \langle Zr \rangle_\beta + \langle O_2 \rangle$	260,200	6.44	-65.99	4	1478-2138	307
$2\langle ZrN \rangle = 2\langle Zr \rangle_\alpha + \langle N_2 \rangle$	174,000	—	-44.61	3	298-1135	184
$2\langle ZrN \rangle = 2\langle Zr \rangle_\beta + \langle N_2 \rangle$	175,850	—	-46.22	3	1135-1500	184
$\langle ZrC \rangle = \langle Zr \rangle + \langle C \rangle$	44,100	—	-2.2	3	298-2200	—

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
Flz. Ag. Silver alloys: partial and integral

System	Components	Thermochemical function	Temp. (°K)	$N_2 =$	
				0.0	0.1
<Ag-Al>	<Ag><Al>	ΔG_{Al}^E	722	-5600	-5620
<Ag-Al>	{Ag} {Al}	ΔH	1273	0	-750
	{Al}	ΔH_{Al}	1273	-8500	-6553
<Ag-Au>	<Ag><Au>	ΔH	800	0	-430
	<Au>	ΔH_{Au}	800	-4850	-3796
<Ag-Au>	{Ag} {Au}	ΔH	1350	0	-443
	{Au}	ΔH_{Au}	1350	-4920	-3985
<Ag-Bi>	{Ag} {Bi}	ΔH	1000	0	—
	{Bi}	ΔH_{Bi}	1000	—	—
<Ag-Cd>	<Ag><Cd>	ΔH	673	0	-603
	<Cd>	ΔH_{Cd}	673	-6400	-5597
<Ag-Cd>	{Ag} {Cd}	ΔG^E	1223	0	-521
	{Cd}	ΔG_{Cd}^E	1223	—	-4536
<Ag-Cu>	{Ag} {Cu}	ΔH	1423	0	+455
	{Cu}	ΔH_{Cu}	1423	+5500	+3750
<Ag-Ga>	{Ag} {Ga}	ΔH	1000	0	—
	{Ga}	ΔH_{Ga}	1000	—	—
<Ag-Ge>	{Ag} {Ge}	ΔH	1250	0	-163
	{Ge}	ΔH_{Ge}	1250	-3000	-510
<Ag-Hg>	<Hg>	ΔG_{Hg}^E	500	-2930	-2320
<Ag-In>	{Ag} {In}	ΔH	1100	0	—
	{In}	ΔH_{In}	—	-4500	—
<Ag-Mg>	<Ag><Mg>	ΔH	773	0	-1110
	<Mg>	ΔH_{Mg}	773	-11200	-9185
<Ag-Mn>	<Mn> β	ΔG_{Mn}^E	1150	+200	+818
<Ag-Pb>	{Ag} {Pb}	ΔH	1273	0	+252
	{Pb}	ΔH_{Pb}	1273	+2500	+2500
<Ag-Pd>	<Ag><Pd>	ΔH	1200	0	-664
	<Pd>	ΔG_{Pd}^E	1200	-5860	-4080
<Ag-S>	$\frac{1}{2}(S_2)$	ΔH_S	1400	-17370	-20530
<Ag-Sb>	<Sb>	ΔG_{Sb}^E	600	-814	-1336
<Ag-Sb>	{Ag} {Sb}	ΔH	1250	0	-504
	{Sb}	ΔH_{Sb}	1250	-6000	-4022
<Ag-Si>	{Ag} {Si}	ΔH	1473	0	-62
	{Si}	ΔH_{Si}	1473	-1193	+24
<Ag-Sn>	{Ag} {Sn}	ΔH	1250	0	-536
	{Sn}	ΔH_{Sn}	900	—	—
	{Sn}	ΔG_{Sn}^E	1250	+990	-334
<Ag-Tl>	{Ag} {Tl}	ΔH	—	—	+173
	{Tl}	ΔH_{Tl}	975	—	—
<Ag-Zn>	<Ag><Zn>	ΔH	873	0	-400
	<Zn>	ΔH_{Zn}	873	-2826	-3397
<Ag-Zn>	{Ag} {Zn}	ΔG^E	1023	—	—
	{Zn}	ΔG_{Zn}^E	1023	—	—

F1 β . Ag. Silver alloys: partial and integral

<Ag-Al>	{Ag} {Al}	ΔS^E	+1273	0 0	-0.013
	{Al}	ΔS_{Al}^E	1273	-0.314	0.00
<Ag-Au>	<Ag><Au>	ΔS^E	800	0	-0.122
	<Au>	ΔS_{Au}^E	800	-1.356	-1.103
<Ag-Au>	{Ag} {Au}	ΔS^E	1350	0	-0.148
	{Au}	ΔS_{Au}^E	1350	-1.584	-1.376

binary metallic systems
element named in the first column)
excess Gibbs energies of solution in cal/g-atom

	0.3	0.5	0.7	0.9	Ref.
-3130	—	—	—	—	99
-1530	-942	-270	+67	—	99
-2146	+1320	+540	+97	—	99
-967	-1111	-900	-370	—	99
-2137	-1009	-334	-34	—	99
-1033	-1230	-1033	-443	—	99
-2410	-1230	-443	-49	—	99
+167	+292	+409	+250	—	99
+558	+674	+438	+65	—	99
-1458	—	-1540 _e	—	—	99
-3684	—	—	—	—	99
-1092	-1134	-810	-286	—	99
-2070	-710	-132	0	—	99
+921	+1014	+829	+352	—	99
+1788	+900	+343	+38	—	99
-868	-638	-204	+55	—	99
-863	+350	+411	+77	—	99
+94	+534	+642	+329	—	99
+1750	+1310	+492	+61	—	99
-294	—	—	—	—	99
-1350	-988	-472	-122	—	99
-1973	+426	+157	+22	—	99
—	-4400	—	—	—	99
—	—	—	—	—	99
+1710	—	—	—	—	99
+696	+885	+711	+274	—	99
+1913	+880	+220	+11	—	99
-1317	-1200	-780	-250	—	99
-1140	+230	+210	+21	—	99
-29,450	—	—	—	—	307
—	—	—	—	—	99
-630	-15	+240	+157	—	99
+1531	+1060	+352	+40	—	99
+187	+628	+856	+509	—	967
+1672	+1565	+855	+167	—	967
-640	-227	+59	+83	—	99
—	+600	+190	+42	—	99
-1233	-1025	-552	-77	—	99
+450	+594	+547	+280	—	99
+1220	+735	+328	+64	—	99
-2025	-952 β	-930 _e	—	—	99
-2248	-1885 β	-50 _e	—	—	99
-1020	-1104	-860	-320	—	99
-2600	-1005	-227	-8	—	99

excess entropies of solution in cal/deg g-atom

+0.018	+0.372	+0.479	+0.274	99
+0.312	+1.298	+0.416	+0.069	99
-0.287	-0.343	-0.289	-0.125	99
-0.672	-0.345	-0.125	-0.014	99
-0.367	-0.468	-0.418	-0.190	99
-0.947	-0.541	-0.216	-0.026	99

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F1 β . Ag: Silver alloys: partial and integral

System	Components	Thermo- chemical function	Temp. (°K)	$N_2 =$	
				0-0	0-1
{Ag-Bi}	{Ag} {Bi}	ΔS^E	1000	0	—
	{Bi}	ΔS^E_{Bi}	1000	—	—
<Ag-Cd>	<Ag> {Cd}	ΔS^E	673	0	-0.085
	<Cd>	ΔS^E_{Cd}	673	-1.486	-0.514
{Ag-Cu}	{Ag} {Cu}	ΔS^E	1423	0	+0.104
	{Cu}	ΔS^E_{Cu}	1423	+1.430	+0.737
{Ag-Ga}	{Ag} {Ga}	ΔS^E	1000	0	—
	{Ga}	ΔS^E_{Ga}	1000	—	—
{Ag-Ge}	{Ag} {Ge}	ΔS^E	1250	0	-0.006
	{Ge}	ΔS^E_{Ge}	1250	-0.640	+0.424
{Ag-In}	{Ag} {In}	ΔS^E	1100	0	—
	{In}	ΔS^E_{In}	1100	—	—
<Ag-Mg>	<Ag> {Mg}	ΔS^E	773	0	+0.133
	<Mg>	ΔS^E_{Mg}	773	+1.682	+3.186
{Ag-Pb}	{Ag} {Pb}	ΔS^E	1273	0	+0.161
	{Pb}	ΔS^E_{Pb}	1273	+2.12	+1.334
<Ag-Pd>	<Ag> {Pd}	ΔS^E	1200	0	-0.203
{Ag-S}	$\frac{1}{2}$ (S ₂)	ΔS^E	1400	-11.2	-12.33
{Ag-Sb}	{Ag} {Sb}	ΔS^E	1250	0	+0.068
	{Sb}	ΔS^E_{Sb}	1250	+1.012	+0.536
{Ag-Si}	{Ag} {Si}	ΔS^E	1473	-1.29	-0.715
{Ag-Sn}	{Ag} {Sn}	ΔS^E	1250	0	-0.16
	{Sn}	ΔS^E_{Sn}	900	—	—
{Ag-Tl}	{Ag} {Tl}	ΔS^E	975	0	—
	{Tl}	ΔS^E_{Tl}	975	—	—
<Ag-Zn>	<Ag> {Zn}	ΔS^E	873	0	-0.096
	<Zn>	ΔS^E_{Zn}	873	-0.03	+0.006

F2 α . Al: Aluminium alloys: partial and integral heats or

<Al-Ag>	<Ag>	ΔG^E_{Ag}	722	+706	—
{Al-Ag}	{Al} {Ag}	ΔH	1273	0	+67
	{Ag}	ΔH_{Ag}	1273	+1750	-203
{Al-Au}	{Al} {Au}	ΔH	1338	0	-1845
	{Au}	ΔH_{Au}	1338	-16,665	-19,624
{Al-Be}	{Al} {Be}	ΔH	1600	—	—
{Al-Bi}	{Al} {Bi}	ΔH	—	0	+532
	{Bi}	ΔH_{Bi}	1173	+5310	—
{Al-Cu}	{Al} {Cu}	ΔH	1373	0	-459
	{Cu}	ΔH_{Cu}	1373	-4225	-4850
{Al-Fe}	{Al} {Fe}	ΔH	971	-30,700	—
{Al-Ga}	{Al} {Ga}	ΔH	1023	0	+71
	{Ga}	ΔH_{Ga}	1023	+832	+600
{Al-Ge}	{Al} {Ge}	ΔH	1200	0	-272
	{Ge}	ΔH_{Ge}	1200	-2760	-2658
{Al-In}	{Al} {In}	ΔH	1173	0	+584
	{In}	ΔH_{In}	1173	+6800	+5006
{Al-Mg}	{Al} {Mg}	ΔH	1073	0	-312
	{Mg}	ΔH_{Mg}	1073	-3480	-2833
{Al-Pb}	{Al} {Pb}	ΔH	>1650	0	+924
	{Pb}	ΔH_{Pb}	1200	+9970	—
{Al-Si}	{Al} {Si}	ΔH	—	0	-244
	{Si}	ΔH_{Si}	—	-2500	-2175

binary metallic systems (contd.)
element named in the first column)
excess entropies of solution in cal/deg g-atom (contd.)

0-3	0-5	0-7	0-9	Ref.
+0.172	+0.097	+0.132	+0.072	99
-0.107	+0.066	+0.168	+0.001	99
-0.201	—	-0.348 _e	—	99
-1.117	—	—	—	99
+0.154	+0.121	+0.081	+0.030	99
+0.109	+0.024	+0.020	+0.001	99
+0.361	+0.481	+0.622	+0.404	99
+0.470	+0.921	+0.685	+0.120	99
+0.227	+0.466	+0.467	+0.208	99
+1.264	+0.802	+0.276	+0.016	99
-0.871	-0.607	-0.302	-0.104	99
-1.346	+0.337	+0.022	-0.001	99
—	-0.090	—	—	99
—	—	—	—	99
+0.375	+0.438	+0.305	+0.093	99
+0.895	+0.345	+0.006	-0.01	99
-0.38	-0.438	-0.405	-0.167	99
-17.28	—	—	—	307
+0.31	+0.606	+0.544	+0.23	99
+2.004	+0.820	+0.232	+0.027	99
-0.025	+0.24	+0.215	+0.07	967
-0.043	+0.189	+0.206	+0.046	99
—	+0.334	+0.034	+0.021	99
+0.14	+0.133	+0.089	+0.053	99
+0.21	+0.06	+0.028	+0.025	99
+0.109	+0.376 β	+0.255 _e	—	99
+0.419	-0.370 β	+0.712 _e	—	99

excess Gibbs energies of solution in cal/g-atom

—	—	-527 _e	-14	99
-270	-942	-1531	-749	99
-2158	-3205	-1267	-104	99
-5795	-8070	-7147	-2916	99
-17,924	-10,092	-3194	-205	99
—	+5112	+2450	+380	99
+1512	+1708	+1167	+440	99
—	—	+154	+31	99
-1445	-2163	-1980	-800	99
-4675	-3270	-680	-65	99
—	—	—	—	99
+148	+157	+120	+49	99
+290	+113	+40	+3	99
-729	-928	-773	-300	99
-1960	-997	-274	-9	99
+1241	+1365	+1087	+455	99
+2506	+1137	+401	+48	99
-719	-806	-614	-230	99
-1580	-641	-157	-8	99
+2130	+2236	+1540	+584	99
—	—	—	—	99
-585	-742	-662	-300	—
-1500	-860	-336	-42	—

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F2 α . Al. Aluminium alloys: partial and integral heats or

System	Components	Thermochemical function	Temp. (°K)	$N_2 =$	
				0.0	0.1
{Al-Sn}	{Al} {Sn}	ΔH	973	0	+464
	{Sn}	ΔH_{Sn}	973	+5845	+3680
<Al-Zn>	<Al> <Zn>	ΔH	653	0	+326
	<Zn>	ΔH_{Zn}	653	+3742	+2850
{Al-Zn}	{Al-Zn}	ΔH	1000	0	+225
	{Zn}	ΔH_{Zn}	1000	+2538	+1995

F2 β . Al. Aluminium alloys: partial and integral

{Al-Ag}	{Al} {Ag}	ΔS^E	1273	0	+0.274
	{Ag}	ΔS_{Ag}^E	1273	+3.515	+2.122
{Al-Au}	{Al} {Au}	ΔS^E	1338	0	+0.326
	{Au}	ΔS_{Au}^E	1338	+5.635	+1.428
{Al-Be}	{Be}	ΔS_{Be}^E	1600	—	—
{Al-Bi}	{Bi}	ΔS_{Bi}^E	1173	-1.524	—
{Al-Cu}	{Al} {Cu}	ΔS^E	1373	0	+0.275
	{Cu}	ΔS_{Cu}^E	1373	+3.238	+2.344
{Al-Ga}	{Al} {Ga}	ΔS^E	1023	0	+0.043
	{Ga}	ΔS_{Ga}^E	1023	+0.52	+0.35
{Al-Ge}	{Al} {Ge}	ΔS^E	1200	0	+0.087
	{Ge}	ΔS_{Ge}^E	1200	+1.176	+0.622
{Al-In}	{Al} {In}	ΔS^E	1173	0	+0.095
	{In}	ΔS_{In}^E	1173	+1.20	+0.74
{Al-Mg}	{Al} {Mg}	ΔS^E	1073	0	+0.001
	{Mg}	ΔS_{Mg}^E	1073	+0.30	-0.255
{Al-Si}	{Al} {Si}	ΔS^E	—	0	+0.054
	{Si}	ΔS_{Si}^E	—	+0.61	+0.455
{Al-Sn}	{Al} {Sn}	ΔS^E	973	0	+0.160
	{Sn}	ΔS_{Sn}^E	973	+2.245	+1.107
<Al-Zn>	<Al> <Zn>	ΔS^E	653	0	+0.115
	<Zn>	ΔS_{Zn}^E	653	+1.426	+1.009
{Al-Zn}	{Al} {Zn}	ΔS^E	1000	0	+0.081
	{Zn}	ΔS_{Zn}^E	1000	+1.007	+0.65

F3 α . Au. Gold alloys: partial and integral heats or

<Au-Ag>	<Ag> <Au>	ΔH	800	0	-371
	<Ag>	ΔH_{Ag}	800	-4040	-3404
{Au-Ag}	{Au} {Ag}	ΔH	1350	0	-443
	{Ag}	ΔH_{Ag}	1350	-4920	-3985
{Au-Al}	{Au} {Al}	ΔH	1338	0	-2916
	{Al}	ΔH_{Al}	1338	-30,724	-27,304
{Au-Bi}	{Au} {Bi}	ΔH	973	0	—
	{Bi}	ΔH_{Bi}	973	—	—
<Au-Cd>	<Au> <Cd>	ΔH	700	0	-1431 α
	<Cd>	ΔH_{Cd}	700	-15,600	-13,203
{Au-Cd}	{Au} {Cd}	ΔG^E	1000	0	—
	{Cd}	ΔG_{Cd}^E	1000	—	—
<Au-Co>	<Co> β	ΔH_{Co}	1150	+9590	+8877
<Au-Cu>	<Au> <Cu>	ΔH	800	0	-290
	<Cu>	ΔH_{Cu}	800	-2780	-2956

binary metallic systems (contd.)
element named in the first column)
excess Gibbs energies of solution in cal/g-atom (contd.)

0.3	0.5	0.7	0.9	Ref.
+900	+966	+762	+316	99
+1690	+766	+273	+33	99
+715	+825	—	—	99
+1504	+905	—	—	99
+516	+614	+526	+234	99
+1178	+631	+145	+36	99

excess entropies of solution in cal/deg g-atom

+0.48	+0.372	+0.018	-0.013	99
+0.627	-0.553	-0.109	-0.015	99
+0.124	-0.028	+0.044	+0.127	99
-0.991	-0.058	+0.23	+0.056	99
—	+2.502	+1.151	+0.178	99
—	—	-0.074	+0.019	99
0.615	+0.812	+0.918	+0.491	99
+1.505	+1.141	+0.871	+0.092	99
+0.083	+0.080	+0.056	+0.021	99
+0.14	+0.037	+0.013	+0.001	99
+0.131	+0.104	+0.07	+0.026	99
+0.098	+0.023	+0.011	+0.001	99
+0.164	+0.142	+0.088	+0.032	99
+0.198	+0.031	0	+0.007	99
-0.106	-0.198	-0.195	-0.086	99
-0.532	-0.322	-0.109	-0.008	99
+0.112	+0.060	-0.013	-0.053	—
+0.10	-0.13	-0.14	-0.03	—
+0.27	+0.29	+0.25	+0.12	99
+0.468	+0.265	+0.128	+0.03	99
+0.254	+0.314	—	—	99
+0.51	+0.524	—	—	99
+0.171	+0.226	+0.212	+0.08	99
+0.405	+0.311	+0.106	-0.005	99

excess Gibbs energies of solution in cal/g-atom

-899	-1111	-967	-429	99
-2220	-1214	-466	-55	99
-1033	-1230	-1033	-443	99
-2411	-1230	-443	-49	99
-7147	-8070	-5795	-1845	99
-16,370	-6047	-597	+130	99
+100	+150	+120	+45	99
+423	+167	+29	+2	99
-3393 α_2	-4440 β	-3660 ϵ	—	99
-9390 α_2	-4855 β	-4200 ϵ	—	99
—	-3153	-2574	-1036	99
—	-3173	-936	-77	99
—	—	—	—	99
-854	-1221	-1189	-440	99
-2610	-1765	-632	+29	99

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F3 α . Au. Gold alloys: partial and integral heats or

System	Components	Thermochemical function	Temp. (°K)	$N_2 =$	
				0.0	0.1
{Au-Cu}	{Au} {Cu}	ΔH	1550	0	-343
	{Cu}	ΔH_{Cu}	1550	-3725	-3163
<Au-Fe>	<Au> <Fe> α	ΔH	1123	0	+528
	<Fe> α	ΔH_{Fe}	1123	+6090	+4415
{Au-Fe}	{Au} {Fe}	ΔH	1473	0	+1400
	{Fe}	ΔH_{Fe}	1473	15,500	12,795
{Au-Ga}	{Au} {Ga}	ΔH	1030	0	-1885*
	{Ga}	ΔH_{Ga}	1030	-22,400*	-15,600*
{Au-Ge}	{Au} {Ge}	ΔH	1423	0	-510
<Au-Hg>	<Hg>	ΔH_{Hg}	500	-1270	-530
{Au-Mn}	{Au} {Mn}	ΔG^E	1535	0	-837
	{Mn}	ΔG^E_{Mn}	1535	-8500	-8667
<Au-Ni>	<Au> <Ni>	ΔH	1150	0	+500
	<Ni>	ΔH_{Ni}	1150	+5140	+4844
{Au-Pb}	{Au} {Pb}	ΔH	1200	0	-104
	{Pb}	ΔH_{Pb}	1200	—	-728
<Au-Pd>	<Au> <Pd>	ΔH	—	0	-975
	<Pd>	ΔH_{Pd}	—	-11,140	-7710
<Au-Pt>	<Au> <Pt>	ΔH	—	0	0
	<Pt>	ΔH_{Pt}	—	-635	+510
{Au-Sn}	{Au} {Sn}	ΔH	823	0	—
	{Sn}	ΔH_{Sn}	823	—	—
{Au-Te}	<Au> {Te}	ΔH	737	0	—
{Au-Tl}	{Au} {Tl}	ΔH_{Tl}	973	—	—
{Au-Zn}	{Au} {Zn}	ΔH	1080	—	—
	{Zn}	ΔH_{Zn}	1080	—	—

* Supercooled.

F3 β . Au. Gold alloys: partial and integral

<Au-Ag>	<Au> <Ag>	ΔS^E	800	0	-0.122
	<Ag>	ΔS^E_{Ag}	800	-1.388	-1.120
{Au-Ag}	{Au} {Ag}	ΔS^E	1350	0	-0.190
	{Ag}	ΔS^E_{Ag}	1350	-2.163	-1.658
{Au-Al}	{Au} {Al}	ΔS^E	1338	0	+0.127
	{Al}	ΔS^E_{Al}	1338	+2.00	+0.77
{Au-Bi}	{Au} {Bi}	ΔS^E	973	0	—
	{Bi}	ΔS^E_{Bi}	973	—	—
<Au-Cd>	<Au> <Cd>	ΔS^E	700	0	-0.687 α
	<Cd>	ΔS^E_{Cd}	700	-8.357	-5.716
<Au-Co>	<Co> β	ΔS^E	1150	+2.00	+3.524
<Au-Cu>	<Au> <Cu>	ΔS^E	800	0	+0.047
	<Cu>	ΔS^E_{Cu}	800	+0.612	+0.360
{Au-Cu}	{Au} {Cu}	ΔS^E	1550	0	+0.113
	{Cu}	ΔS^E_{Cu}	1550	+1.306	+0.964
<Au-Fe>	<Au> <Fe> α	ΔS^E	1123	0	+0.41
	<Fe> α	ΔS^E_{Fe}	1123	+5.20	+3.03
{Au-Fe}	{Au} {Fe}	ΔS^E	1473	0	+1.09
	{Fe}	ΔS^E_{Fe}	1473	+12.763	+9.35
{Au-Ga}	{Au} {Ga}	ΔS^E	1400	0	0.0
	{Ga}	ΔS^E_{Ga}	1400	-1.06	0.0
{Au-Ge}	{Au} {Ge}	ΔS^E	1423	0	-0.09
<Au-Hg>	<Hg>	ΔS^E_{Hg}	500	-2.00	-1.14

binary metallic systems (contd.)
element named in the first column)
excess Gibbs energies of solution in cal/g-atom (contd.)

					Ref.
0.3	0.5	0.7	0.9		
- 839	- 1044	- 915	- 408		99
- 2090	- 1156	- 449	- 53		99
+ 1167	+ 1566	—	—		99
+ 2870	+ 2310	—	—		99
+ 3360	+ 4100	—	—		99
+ 8153	+ 4380	—	—		99
- 3750	- 3820	- 2720	- 968		976
- 6730	- 2290	- 495	- 29		976
- 1080	- 1120	- 830	- 300		957
—	—	—	—		99
- 2706	- 4205	- 3407	- 1120		99
- 9628	- 5670	- 437	+ 52		99
+ 1347	+ 1807	+ 1608	+ 643		99
+ 3768	+ 2235	+ 715	+ 28		99
- 189	- 167	- 73	+ 62		99
- 272	- 22	+ 131	+ 82		99
- 1830	- 1780	- 1132	- 344		958
- 3085	- 765	+ 14	+ 34		958
+ 265	+ 635	+ 795	+ 455		958
+ 1550	+ 1500	+ 740	+ 107		958
- 2467	- 2766	- 2090	- 760		99
- 5422	- 2223	- 444	- 22		99
—	+ 1010	+ 659	+ 253		965
—	+ 49	- 3	- 2		99
- 4230	- 5436	- 4487	- 1747		99
- 12,000	- 6020	- 1440	- 94		99

excess entropies of solution in cal/deg g-atom

-0.287	-0.343	-0.289	-0.125	99
-0.672	-0.341	-0.122	-0.013	99
-0.418	-0.468	-0.367	-0.148	99
-0.890	-0.396	-0.121	-0.011	99
+0.044	-0.028	+0.124	+0.326	99
-0.392	+0.002	+0.603	+0.203	99
+0.245	+0.298	+0.244	+0.106	99
+0.61	+0.295	+0.09	+0.015	99
-1.586 α_2	-1.576 β	-1.51 ϵ	—	99
-3.81 α_2	-1.884 β	-3.69 ϵ	—	99
—	—	—	—	99
+0.081	+0.070	+0.031	+0.06	99
+0.094	-0.034	+0.023	+0.053	99
+0.238	+0.254	+0.189	+0.071	99
+0.469	+0.181	+0.044	+0.003	99
+0.71	+0.76	—	—	99
+1.107	+0.773	—	—	99
+2.305	+2.463	—	—	99
+4.553	+1.76	—	—	99
+0.06	+0.27	+0.30	+0.06	976
+0.78	+0.625	+0.245	+0.03	976
-0.13	+0.03	+0.13	+0.16	957
—	—	—	—	99

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F3 β . Au. Gold alloys: partial and integral

System	Components	Thermochemical function	Temp. (°K)	$N_2 =$	
				0.0	0.1
<Au-Ni>	<Au><Ni>	ΔS^E	1150	0	+0.139
		ΔS^E_{Ni}	1150	+1.213	+1.516
{Au-Pb}	{Au}{Pb}	ΔS^E	1200	0	+0.153
		ΔS^E_{Pb}	1200	—	+1.377
<Au-Pd>	<Au><Pd>	ΔS^E	—	0	-0.27
		ΔS^E_{Pd}	—	-3.0	-2.43
<Au-Pt>	<Au><Pt>	ΔS^E	—	0	-0.29
		ΔS^E_{Pt}	—	-3.50	-2.41
{Au-Sn}	{Au}{Sn}	ΔS^E	823	0	—
		ΔS^E_{Sn}	823	—	—
{Au-Tl}	{Au}{Tl}	ΔS^E	973	—	—
{Au-Zn}	{Au}{Zn}	ΔS^E	1080	0	—
		ΔS^E_{Zn}	1080	—	—

F4 α . Co. Cobalt alloys: partial and integral heats or

{Co-Al}	{Al}	ΔG^E_{Al}	1873	-19,754	-16,395
{Co-Cr}	{Co}>fcc	ΔH	1473	0	+75
	{Cr}>bcc				
{Co-Cu}	{Cr}	$\Delta \bar{H}_{Cr}$	1473	+670	+965
	{Cu}	ΔG^E_{Cu}	1300	(9100)	—
{Co-Fe}	{Co}> γ {Fe}> γ	ΔH	1473	0	-105
(f.c.c.)	{Fe}> γ	$\Delta \bar{H}_{Fe}$	1473	-1085	-996
{Co-Fe}	{Co}>{Fe}	ΔH	1873	0	-219
	{Fe}	$\Delta \bar{H}_{Fe}$	1873	—	-1987
{Co-Ge}	{Co}>{Ge}	ΔH	1287	0	—
{Co-Mn}	{Co}>{Mn}> β	ΔG^E	1023	0	-511
	{Mn}> β	$\Delta \bar{G}^E_{Mn}$	1023	-5875	-4455
{Co-Mo}	{Mo}	$\Delta \bar{G}^E_{Mo}$	1350	+4000	+3420
Co-Ni					this system is nearly ideal in
{Co-Pt}	{Co}>{Pt}	ΔG^E	1273	0	-1067
{Co-Si}	{Co}>{Si}	ΔH	1873	0	-3470
	{Si}	$\Delta \bar{H}_{Si}$	1873	-35,000	-34,100
{Co-Sn}	{Co}>{Sn}	ΔH	1773	0	-380

F4 β . Co. Cobalt alloys: partial and integral

<Co-Cr>	<Co><Cr>	ΔS^E	1473	0	+0.064
<Co-Cr>	<Co><Cr>	ΔS^E_{Cr}	1473	+0.42	+0.705
<Co-Fe>	—	—	—	—	—
<Co-Fe>	—	—	—	—	—
{Co-Si}	{Co}{Si}	ΔS^E	1873	0	-0.61
{Co-Si}	{Co}{Si}	ΔS^E_{Si}	1873	-6.06	-6.29

F5 α . Cr. Chromium alloys: partial and integral heats or

<Cr-Co>	{<Co>fcc <Cr>bcc <Co>fcc}	ΔH	1473	0	+715
<Cr-Co>	{<Co>fcc <Cr>bcc <Co>fcc}	ΔH_{Co}	1473	(8100)	+6080

binary metallic systems (contd.)
element named in the first column)
excess entropies of solution in cal/deg g-atom (contd.)

0.3	0.5	0.7	0.9	Ref.
+0.458	+0.668	+0.561	+0.161	99
+1.513	+0.853	+0.127	-0.039	99
+0.357	+0.425	+0.396	+0.261	99
+0.833	+0.425	+0.324	+0.093	99
-0.63	-0.75	-0.63	-0.27	958
-1.47	-0.75	-0.27	-0.03	958
-0.58	-0.55	-0.35	-0.105	958
-0.95	-0.225	—	—	958
+0.498	+0.313	+0.183	+0.093	99
-0.027	-0.152	+0.092	+0.012	99
—	+0.638	+0.209	+0.02	99
-0.143	-0.493	-0.507	-0.177	99
-1.57	-1.13	-0.17	+0.01	99

excess Gibbs energies of solution in cal/g-atom

-10,207	—	—	—	99
+510	—	+1700	+715	953
+3140	—	—	+120	953
—	—	—	—	99
-270	-314	-233	-85	974
-677	-260	-53	-4	974
-508	-580	-456	-182	974
-1140	-500	-146	-14	974
—	-596	-1060	-395	966
-1127	-1340	-2485	-1190	99
-2482	-1490	-693	-36	99
—	—	—	—	99
the solid and liquid states				
-2491	-2965	-2491	-1067	960
-9310	-11,150	-8170	-2890	99
-24,400	-8800	-1400	-30	954
-550	-250	+130	+200	99

excess entropies of solution in cal/deg g-atom

+0.426	—	+1.479	+0.905	953
+2.635	—	—	+0.545	953
—	—	—	—	—
-1.73	-2.20	-1.72	-0.64	954
-4.78	-2.15	-0.44	-0.02	954

excess Gibbs energies of solution in cal/g-atom

+1700	—	+510	+75	953
—	—	-618	-24	953

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F5 α . Cr. Chromium alloys: partial and integral heats or

System	Components	Thermo- chemical function	Temp. (°K)	$N_2 =$	
				0.0	0.1
<Cr-Fe> α	<Cr><Fe> <Fe>	ΔH	1550	0	+540
		$\Delta \bar{H}_{Fe}$	1550	+6000	+4860
{Cr-Fe}	{Cr} {Fe}	ΔH	$\begin{Bmatrix} 1750- \\ 2150 \end{Bmatrix}$	0	+455
		$\Delta \bar{H}_{Fe}$	$\begin{Bmatrix} 1750- \\ 2150 \end{Bmatrix}$	+5018	+4100
<Cr-Mo>	<Cr><Mo>	ΔH	1400	0	+745
		ΔH	—	0	+1163
<Cr-Ni>	<Cr><Ni> <Ni>	$\Delta \bar{H}_{Ni}$	—	+13,872	+9614
		ΔG_{Ni}^E	—	0	-337
{Cr-Ni}	{Cr} {Ni}	ΔG_{Ni}^E	—	—	-625
		ΔH	1550	0	-437
<Cr-V>	<Cr><V> <V>	$\Delta \bar{H}_V$	1550	-5210	-3594

F5 β . Cr. Chromium alloys: partial and integral

<Cr-Co>	<Cr>bcc <Co>fcc	ΔS^E	1473	0	+0.905
		$\Delta \bar{S}_{Co}^E$	1473	(9.1)	+4.14
<Cr-Fe> α	<Cr><Fe> <Fe>	ΔS^E	1550	0	+0.266
		$\Delta \bar{S}_{Fe}^E$	1550	—	+2.115
{Cr-Fe}	{Cr} {Fe}	ΔS^E	$\begin{Bmatrix} 1750- \\ 2150 \end{Bmatrix}$	0	+0.266
		$\Delta \bar{S}_{Fe}^E$	$\begin{Bmatrix} 1750- \\ 2150 \end{Bmatrix}$	—	+2.115
<Cr-Mo>	<Cr><Mo>	ΔS^E	1200	0	+0.205
		ΔS^E	—	0	+0.662
<Cr-Ni>	<Cr><Ni> <Ni>	$\Delta \bar{S}_{Ni}^E$	—	—	+5.211
		ΔS^E	1550	0	-0.027
<Cr-V>	<Cr><V> <V>	$\Delta \bar{S}_V^E$	1550	-0.429	-0.123

F6 α . Cu. Copper alloys: partial and integral heats or

{Cu-Ag}	{Cu} {Ag}	ΔH	1423	0	+352
		$\Delta \bar{H}_{Ag}$	1423	+3900	+2762
{Cu-Al}	{Cu} {Al}	ΔH	1373	0	-800
		$\Delta \bar{H}_{Al}$	1373	-8625	-7415
<Cu-Au>	<Cu><Au> <Au>	ΔH	800	0	-440
		$\Delta \bar{H}_{Au}$	800	-3920	-4660
{Cu-Au}	{Cu} {Au}	ΔH	1550	0	-408
		$\Delta \bar{H}_{Au}$	1550	-4625	-3600
{Cu-Bi}	{Cu} {Bi}	ΔH	1200	0	—
		$\Delta \bar{H}_{Bi}$	1200	—	—
<Cu-Fe>	<Fe><Cu>	ΔH	1323	0	+934
		ΔH	1823	0	+804
{Cu-Fe}	{Cu} {Fe}	$\Delta \bar{H}_{Fe}$	1823	+9300	+6978
		ΔH	1423	0	-510
{Cu-Ge}	{Cu} {Ge}	ΔH	1073	0	—
		$\Delta \bar{H}_{In}$	1073	—	($N_2 = 0.2$) -1427

binary metallic systems (contd.)
element named in the first column)
excess Gibbs energies of solution in cal/g-atom (contd.)

				Ref.
0.3	0.5	0.7	0.9	
+ 1260	+ 1500	+ 1260	+ 540	951
+ 2940	+ 1500	+ 540	+ 60	951
+ 1050	+ 1245	+ 1045	+ 460	951
+ 2430	+ 1240	+ 460	+ 60	951
+ 1555	+ 1725	+ 1345	+ 495	952
+ 2148	+ 1520	+ 336	- 210	968
+ 2461	- 1929	- 1123	- 210	968
- 410	- 653	- 742	- 335	968
- 853	- 1225	- 503	- 35	968
- 779	- 455	- 235	- 203	99
- 718	+ 928	- 790	- 27	99

excess entropies of solution in cal/deg g-atom

+1.479	—	+0.426	+0.064	953
—	—	+0.524	+0.065	953
+0.595	+0.688	+0.554	+0.222	951
+1.375	+0.607	+0.207	+0.024	951
+0.595	+0.688	+0.554	+0.222	951
+1.375	+0.607	+0.207	+0.024	951
+0.42	+0.46	+0.33	+0.087	952
+1.163	+0.967	+0.429	+0.087	968
+1.529	-0.504	-0.291	+0.014	968
+0.030	+0.242	+0.213	+0.004	99
+0.526	+0.864	-0.460	-0.010	99

excess Gibbs energies of solution in cal/g-atom

+829	+1014	+921	+455	99
+1965	+1126	+549	+88	99
-1980	-2163	-1445	-459	99
-5012	-1055	-60	+29	99
-1189	-1221	-854	-290	99
-2487	-677	-101	+7	99
-915	-1044	-839	-343	99
-2002	-931	-303	-30	99
+1224	+1280	+1052	+468	99
+2128	+1055	+451	+77	99
+2300	+2880	+2537	+1138	950
+1790	+2132	+1917	+950	99
+4028	+2282	+1152	+178	99
-1070	-1120	-830	-300	961
-749	-240	+23	+66	99
+465	+829	+233	+40	99

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F6x. Cu. Copper alloys: partial and integral heats or

System	Components	Thermo- chemical function	Temp. (°K)	$N_2 =$	
				0.0	0.1
{Cu-Mg}	{Cu} {Mg}	ΔH	1100	0	—
	{Mg}	$\Delta \bar{H}_{Mg}$	1100	—	($N_2 = 0.2$) -6419
<Cu-Mn> γ	<Cu> <Mn> γ	ΔH	1100	0	+240
	<Mn> γ	$\Delta \bar{G}_{Mn}^E$	1100	-880	-81
{Cu-Mn}	{Cu} {Mn}	ΔG^E	1500	0	-113
	{Mn}	$\Delta \bar{G}_{Mn}^E$	1500	-2000	-356
<Cu-Ni>	<Cu> <Ni>	ΔH	773	0	+130
	<Ni>	$\Delta \bar{H}_{Ni}$	773	+1480	+1285
{Cu-Ni}	{Cu} {Ni}	ΔG^E	—	0	+270
	{Ni}	$\Delta \bar{G}_{Ni}^E$	—	+2970	+2450
{Cu-Pb}	{Cu} {Pb}	ΔH	1473	0	+707
	{Pb}	$\Delta \bar{H}_{Pb}$	1473	+8620	+5790
<Cu-Pd>	<Cu> <Pd>	ΔH	1350	0	-1005
	<Pd>	$\Delta \bar{H}_{Pd}$	1350	-10,900	-9274
<Cu-Pt>	<Cu> <Pt>	ΔH	1350	0	-1228
	<Pt>	$\Delta \bar{H}_{Pt}$	1350	-14,760	-10,178
{Cu-Sb}	{Cu} {Sb}	ΔH	1190	—	—
	{Sb}	$\Delta \bar{H}_{Sb}$	1190	—	(-7000)
{Cu-Si}	{Cu} {Si}	ΔG^E	1760	0	-1380
	{Si}	$\Delta \bar{G}_{Si}^E$	1760	-14,470	-12,260
{Cu-Sn}	{Cu} {Sn}	ΔH	1400	0	-666
	{Sn}	$\Delta \bar{H}_{Sn}$	1400	-8000	-5233
{Cu-Tl}	{Cu} {Tl}	ΔH	1573	0	+647
	{Tl}	$\Delta \bar{H}_{Tl}$	1573	+6730	+6164
<Cu-Zn>	<Cu> <Zn>	ΔH	773	0	-627
	<Zn>	$\Delta \bar{H}_{Zn}$	773	-5500	-6853
{Cu-Zn}	{Zn}	$\Delta \bar{G}_{Zn}^E$	—	—	—
{Cu-O}	$\frac{1}{2}(O_2)$	$\Delta \bar{H}_O$	1673	-20,700	-22,800

F6 β . Cu. Copper alloys: partial and integral

{Cu-Ag}	{Cu} {Ag}	ΔS^E	1423	0	+0.030
	{Ag}	$\Delta \bar{S}_{Ag}^E$	1423	+0.323	+0.293
{Cu-Al}	{Cu} {Al}	ΔS^E	1373	0	+0.491
	{Al}	$\Delta \bar{S}_{Al}^E$	1373	+5.838	+4.086
<Cu-Au>	<Cu> <Au>	ΔS^E	800	0	+0.059
	<Au>	$\Delta \bar{S}_{Au}^E$	800	+1.27	+0.114
{Cu-Au}	{Cu} {Au}	ΔS^E	1550	0	+0.071
	{Au}	$\Delta \bar{S}_{Au}^E$	1550	+0.726	+0.682
{Cu-Bi}	{Cu} {Bi}	ΔS^E	1200	0	—
	{Bi}	$\Delta \bar{S}_{Bi}^E$	1200	—	—
<Cu-Fe>	<Fe> <Cu>	ΔS^E	1323	0	+0.27
{Cu-Fe}	{Cu} {Fe}	ΔS^E	1823	0	+0.038
	{Fe}	$\Delta \bar{S}_{Fe}^E$	1823	+0.411	+0.359
{Cu-Ge}	{Cu} {Ge}	ΔS^E	1423	0	-0.12
{Cu-In}	{Cu} {In}	ΔS^E	1073	0	—
	{In}	$\Delta \bar{S}_{In}^E$	1073	—	($N_2 = 0.2$) -0.095
{Cu-Mg}	{Cu} {Mg}	ΔS^E	1100	0	—
	{Mg}	$\Delta \bar{S}_{Mg}^E$	1100	—	($N_2 = 0.2$) -1.792

binary metallic systems (contd.)
element named in the first column)
excess Gibbs energies of solution in cal/g-atom (contd.)

0.3	0.5	0.7	0.9	Ref.
-2285	-2465	-1933	-908	99
-4520	-1873	-772	-208	99
+608	+764	+1009	+720	99
+730	+872	+621	—	99
+97	+476	+722	+513	99
+1416	+1335	+872	+205	99
+340	+445	+465	+285	949
+880	+600	+405	+90	949
+680	+835	+735	+315	949
+1570	+835	+315	+35	949
+1422	+1607	+1338	+584	99
+2817	+1545	+573	+73	99
-2440	-2557	-2108	-904	99
-5385	-2057	-891	-100	99
-2482	-2650	-1979	-689	99
-4682	-2169	-237	-5	99
-1344	-697	-151	+82	99
-66	+1093	+465	+81	99
-2820	-2810	-1880	-640	954
-4880	-1420	-120	-10	954
-934	-475	-97	+52	99
+252	+681	+311	+49	99
+1661	+2050	+1582	+543	99
+4287	+2031	+259	-11	99
-1754	—	—	—	99
-4150	—	—	—	99
—	-868	-151	+1	99
-35,100	—	—	—	955

excess entropies of solution in cal/deg g-atom

+0.081	+0.121	+0.154	+0.105	99
+0.224	+0.219	+0.174	+0.035	99
+0.918	+0.812	+0.615	+0.275	99
+1.028	+0.484	+0.234	+0.044	99
+0.031	+0.070	+0.081	+0.047	99
+0.049	+0.175	+0.076	+0.012	99
+0.189	+0.254	+0.238	+0.113	99
+0.526	+0.327	+0.138	+0.018	99
+0.448	+0.435	+0.370	+0.179	99
+0.624	+0.335	+0.188	+0.043	99
+0.63	+0.75	+0.63	+0.27	950
+0.110	+0.162	+0.185	+0.131	99
+0.355	+0.241	+0.207	+0.043	99
-0.12	+0.02	+0.13	+0.13	961
-0.057	+0.160	+0.132	+0.085	99
+0.550	+0.401	-0.006	+0.003	99
-0.687	-0.772	-0.698	-0.449	99
-1.372	-0.725	-0.522	-0.185	99

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F6 β . Cu. Copper alloys: partial and integral

System	Components	Thermochemical function	Temp. (°K)	$N_2 =$	
				0.0	0.1
<Cu-Mn> γ	<Cu><Mn> γ	ΔS^E	1100	0	+0.259
<Cu-Ni>	<Cu><Ni>	ΔS^E	—	0	-0.085
	<Ni>	ΔS^E_{Ni}	—	-0.77	-0.70
{Cu-Pb}	{Cu} {Pb}	ΔS^E	1473	0	+0.173
	{Pb}	ΔS^E_{Pb}	1473	+2.55	+1.096
<Cu-Pd>	<Cu><Pd>	ΔS^E	1350	0	-0.150
	<Pd>	ΔS^E_{Pd}	1350	-1.023	-1.887
<Cu-Pt>	<Cu><Pt>	ΔS^E	1350	0	-0.096
	<Pt>	ΔS^E_{Pt}	1350	-1.254	-0.718
{Cu-Sb}	{Cu} {Sb}	ΔS^E	1190	—	—
	{Sb}	ΔS^E_{Sb}	1190	—	(0.35)
{Cu-Sn}	{Cu} {Sn}	ΔS^E	1400	0	+0.251
	{Sn}	ΔS^E_{Sn}	1400	+4.006	+1.477
{Cu-Tl}	{Cu} {Tl}	ΔS^E	1573	0	+0.062
	{Tl}	ΔS^E_{Tl}	1573	+0.305	+0.850
<Cu-Zn>	<Cu><Zn>	ΔS^E	773	0	-0.020
	<Zn>	ΔS^E_{Zn}	773	+1.30	-1.415

F7 α . Fe. Iron alloys: partial and integral heats or

{Fe-Al}	{Fe} {Al}	ΔH	1873	0	-1460
	{Al}	ΔH_{Al}	1873	-15,350	-13,870
<Fe-Au>	<Fe> α <Au>	ΔH	1123	0	—
	<Au>	ΔH_{Au}	1123	—	—
{Fe-Au}	{Fe} {Au}	ΔH	1383	0	—
<Fe-Co>	<Fe> γ <Co> γ	ΔH	1473	0	-85
(fcc)	<Co> γ	ΔH_{Co}	1473	-923	-845
{Fe-Co}	{Fe} {Co}	ΔH	1873	0	-182
	{Co}	ΔH_{Co}	1873	—	-1698
<Fe-Cr> α	<Fe><Cr>	ΔH	1550	0	+540
	<Cr>	ΔH_{Cr}	1550	+6000	+4860
{Fe-Cr}	{Fe} {Cr}	ΔH	—	0	+460
	{Cr}	ΔH_{Cr}	—	+5165	+4060
<Fe-Cu>	<Fe> γ <Cu>	ΔH	1323	0	+1138
{Fe-Cu}	{Fe} {Cu}	ΔH	1823	0	+950
	{Cu}	ΔH_{Cu}	1823	11,370	+7897
{Fe-Ge}	<Fe> {Ge}	ΔH	1287	0	—
<Fe-Ir> γ	<Fe> γ <Ir>	ΔG^E	1473	0	-1266
	<Ir>	ΔG^E_{Ir}	1473	-13,460	-11,760
<Fe-Mn> γ	<Fe> γ <Mn> γ	ΔH	1450	0	-314
	<Mn> γ	ΔH_{Mn}	1450	-3346	-2952
{Fe-Mn}	{Fe} {Mn}	ΔG^E	1863	0	+95
	{Mn}	ΔG^E_{Mn}	1863	+1050	+851
<Fe-Ni>	<Fe> γ <Ni>	ΔH	1200	0	-230
(fcc)	<Ni>	ΔH_{Ni}	1200	—	-1030
{Fe-Ni}	{Fe} {Ni}	ΔH	1873	0	-245
	{Ni}	ΔH_{Ni}	1873	-2400	-2333
<Fe-Pd>	<Fe> γ <Pd>	ΔH	1273	0	+407
	<Pd>	ΔH_{Pd}	1273	+8630	+217
{Fe-Pd}	{Fe} {Pd}	ΔH	1873	0	+246
	{Pd}	ΔH_{Pd}	1873	+5250	+1590

binary metallic systems (contd.)
element named in the first column)
excess entropies of solution in cal/g-atom (contd.)

0.3	0.5	0.7	0.9	Ref.
+0.493	+0.432	+0.485	—	99
-0.190	-0.231	-0.153	-0.010	949
-0.47	-0.185	+0.04	+0.043	949
+0.234	+0.252	+0.225	+0.110	99
+0.277	+0.282	+0.124	+0.021	99
-0.639	-0.846	-0.987	-0.533	99
-2.141	-1.419	-0.830	-0.111	99
-0.179	-0.209	-0.125	+0.039	99
-0.350	-0.328	+0.265	+0.048	99
+0.278	+0.579	+0.570	+0.282	99
+1.587	+0.975	+0.348	+0.052	99
+0.400	+0.545	+0.491	+0.245	99
+1.018	+0.622	+0.277	+0.052	99
+0.288	+0.463	+0.374	+0.109	99
+1.121	+0.657	+0.010	-0.016	99
-0.353	—	—	—	99
-0.944	—	—	—	99

excess Gibbs energies of solution in cal/g-atom

-4529	—	—	—	99
-10,545	—	—	—	99
—	+1450	+1150	+530	981
—	+822	+437	+96	981
—	+1030	+860	+390	956
-233	-314	-270	-105	974
-667	-370	-90	-6	974
-456	-580	-508	-219	974
-1180	-661	-237	-23	974
+1260	+1500	+1260	+540	951
+2940	+1500	+540	+60	951
+1045	+1245	+1050	+455	951
+2410	+1250	+460	+50	951
+2537	+2880	+2300	+934	950
+1917	+2132	+1789	+804	99
+3702	+1982	+830	+118	99
—	+2140	+1160	+440	966
-3032	-3347	-2565	-1010	99
-6723	-2577	-756	-71	99
-1482	-1653	-1456	-796	99
-2291	-1578	-769	-112	99
+221	+263	+221	+95	99
+515	+263	+95	+11	99
-465	-885	-1000	-496	972
-2110	-1430	-940	-80	972
-700	-1100	-1160	-580	972
-2324	-1724	-916	-49	972
-678	-2257	-2873	-1510	99
-6233	-5640	-2418	-284	99
+464	+530	+478	+219	99
+932	+550	+274	+28	99

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F7 α . Fe. Iron alloys: partial and integral heats or

System	Components	Thermo- chemical function	Temp. (°K)	$N_2 =$	
				0.0	0.1
<Fe-Pt>	<Fe> γ <Pt>	ΔG^E	1123	0	-1368 γ
		ΔG_{Pt}^E	1123	-18,120	-11,744
{Fe-Pt}	{Fe} {Pt}	ΔG^E	1880	0	-1780
		ΔG_{Pt}^E	1880	-16,000	-18,643
{Fe-S}	{S ₂ }	$\Delta H_{S_2}^E$	—	-60,500	-60,100
		ΔH	1873	0	-3050
{Fe-Si}	{Si}	ΔH_{Si}^E	1873	-31,400	-29,900
		ΔG^E	1820	0	+367
{Fe-Sn}	{Sn}	ΔG_{Sn}^E	1820	+3724	+3606
		ΔH	1600	0	-311
<Fe-V>	<V>	ΔH_V	1600	-3090	-2990
		ΔG^E	2193	0	-225
{Fe-V}	{V}	ΔG_V^E	2193	-2550	-2395

F7 β . Fe. Iron alloys: partial and integral

{Fe-Al}	{Al}	ΔS^E	1873	0	-0.27
		ΔS_{Al}^E	1873	-2.523	-2.81
{Fe-Au}	{Au}	ΔS^E	1383	—	—
		—	—	—	—
<Fe-Co>	<Co>	ΔS^E	1550	0	+0.222
		ΔS_{Co}^E	1550	+2.45	+2.01
{Fe-Cr}	{Cr}	ΔS^E	1750-2150	0	+0.222
		ΔS_{Cr}^E	1750-2150	+2.45	+2.01
<Fe-Cu>	<Cu>	ΔS^E	1323	0	+0.27
		ΔS_{Cu}^E	1323	+3.0	+2.43
{Fe-Cu}	{Cu}	ΔS^E	1823	0	+0.038
		ΔS_{Cu}^E	1823	+1.76	+0.917
<Fe-Mn> γ	<Mn> γ	ΔS^E	1450	0	-0.296
		ΔS_{Mn}^E	1450	-3.17	-2.76
<Fe-Ni> γ	<Ni>	ΔS^E	1200	0	-0.059
		ΔS_{Ni}^E	1200	—	+0.292
{Fe-Ni}	{Ni}	ΔS^E	1873	0	-0.051
		ΔS_{Ni}^E	1873	-0.509	-0.509
<Fe-Pd> γ	<Pd>	ΔS^E	1273	0	+0.613
		ΔS_{Pd}^E	1273	+8.553	+4.045
{Fe-Pd}	{Pd}	ΔS^E	1873	0	-0.029
		ΔS_{Pd}^E	1873	+0.753	-0.513
{Fe-S}	{S ₂ }	ΔS^E	—	-12.75	-11.70
		$\Delta S_{S_2}^E$	—	0	-0.50
{Fe-Si}	{Si}	ΔS^E	1873	-4.186	-5.67
		ΔS_{Si}^E	1873	0	-0.127
<Fe-V>	<V>	ΔS^E	1600	0	+2.065
		ΔS_V^E	1600	+3.4	+2.065

F8 α . Mg. Magnesium alloys: partial and integral heats or

{Mg-Al}	{Al}	ΔH	1073	0	-230
		ΔH_{Al}	1073	-2358	-2227
{Mg-Bi}	{Bi}	ΔH	1100	0	-1850
		ΔH_{Bi}	1100	—	-16,700

binary metallic systems (contd.)
element named in the first column)
excess Gibbs energies of solution in cal/g-atom (contd.)

0.3	0.5	0.7	0.9	Ref.
-3342 γ	-4344 γ_2	-3276 γ_3	-1591 γ	99
-8970	-4520 γ_2	-855 γ_3	0	99
-5140	-6972	—	—	99
-14,943	-8283	—	—	99
-59,200	-57,400	—	—	307
-7980	-9050	-6700	-2450	959
-19,400	-6650	-1340	-90	959
+1013	—	—	—	99
+2965	—	—	—	99
-858	-1253	-1323	-529	973
-2532	-2040	-526	-66	973
-660	-1071	-1240	-654	972
-2070	-1850	-1080	-120	972

excess entropies of solution in cal/deg g-atom

-0.84	—	—	—	99
-2.706	—	—	—	99
—	—	+0.60	+0.38	956
—	—	—	—	—
+0.554	+0.688	+0.595	+0.266	951
+1.36	+0.77	+0.26	+0.05	951
+0.554	+0.688	+0.595	+0.266	951
+1.36	+0.77	+0.26	+0.05	951
+0.63	+0.75	+0.63	+0.27	950
+1.47	+0.75	+0.27	+0.03	950
+0.110	+0.162	+0.185	+0.131	99
+0.133	+0.084	+0.005	+0.002	99
-0.757	-1.017	-0.983	-0.491	99
-2.053	-1.35	-0.64	-0.093	99
-0.069	-0.194	-0.248	-0.134	972
-0.427	-0.269	-0.313	-0.061	972
-0.154	-0.264	-0.296	-0.178	972
-0.561	-0.420	-0.277	-0.042	972
+0.817	+0.689	+0.461	+0.164	99
+0.667	+0.21	+0.07	+0.001	99
-0.112	-0.135	-0.098	-0.034	99
-0.304	-0.109	-0.013	-0.001	99
-10.29	-16.78	—	—	307
-1.65	-2.06	-1.71	-0.666	959
-4.71	-2.145	-0.61	-0.04	959
-0.331	-0.386	-0.263	-0.032	972
+0.553	-0.342	-0.125	-0.042	972

excess Gibbs energies of solution in cal/g-atom

-614	-806	-720	-312	99
-1681	-972	-350	-32	99
-4500	-4530	-3000	-750	962
-8370	-2610	+690	+100	962

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F8z. Mg. Magnesium alloys: partial and integral heats or

System	Components	Thermo- chemical function	Temp. (°K)	$N_2 =$	
				0-0	0-1
{Mg-Ca}	{Mg}{Ca}	ΔH	1110	0	(-1180)
		$\Delta \bar{H}_{Ca}$	1110	—	—
<Mg-Cd>	<Mg><Cd>	ΔH	543	0	-397
		$\Delta \bar{H}_{Cd}$	543	-4030	-3870
{Mg-Cd}	{Mg}{Cd}	ΔH	923	0	-484
		$\Delta \bar{H}_{Cd}$	923	-5572	-4227
{Mg-Cu}	{Mg}{Cu}	ΔH	1100	0	-908
		$\Delta \bar{H}_{Cu}$	1100	-11,760	-7206
{Mg-In}	{Mg}{In}	ΔH	923	0	-671
		$\Delta \bar{H}_{In}$	923	-7090	-6306
{Mg-Li}	{Mg}{Li}	ΔH	1000	0	-363
		$\Delta \bar{H}_{Li}$	1000	-3020	-3990
{Mg-Ni}	{Mg}{Ni}	$\Delta \bar{G}_{Ni}$	1000	-10,023	-5058
		ΔH	973	0	-945
{Mg-Pb}	{Mg}{Pb}	$\Delta \bar{H}_{Pb}$	973	-9500	-9133
		ΔH	1100	0	-5250
{Mg-Sb}	{Mg}{Sb}	$\Delta \bar{H}_{Sb}$	1100	—	-43,900
		ΔG^E	1073	0	-1607
{Mg-Sn}	{Mg}{Sn}	$\Delta \bar{G}_{Sn}^E$	1073	-18,955	-13,568
		ΔH	923	0	-662
{Mg-Tl}	{Mg}{Tl}	$\Delta \bar{H}_{Tl}$	923	-6350	-6350
		ΔH	923	0	-500
{Mg-Zn}	{Mg}{Zn}	$\Delta \bar{H}_{Zn}$	923	-5200	-4400

F8 β . Mg. Magnesium alloys: partial and integral

{Mg-Al}	{Mg}{Al}	ΔS^E	1073	0	-0.086
		$\Delta \bar{S}_{Al}^E$	1073	-0.923	-0.786
{Mg-Bi}	{Mg}{Bi}	ΔS^E	1100	0	-1.005
		$\Delta \bar{S}_{Bi}^E$	1100	—	-9.525
{Mg-Ca}	{Mg}{Ca}	ΔS^E	1110	0	(-0.31)
		$\Delta \bar{S}_{Ca}^E$	1110	—	—
<Mg-Cd>	<Mg><Cd>	ΔS^E	543	0	-0.08
		$\Delta \bar{S}_{Cd}^E$	543	-0.758	-0.834
{Mg-Cd}	{Mg}{Cd}	ΔS^E	923	0	-0.137
		$\Delta \bar{S}_{Cd}^E$	923	-1.925	-0.956
{Mg-Cu}	{Mg}{Cu}	ΔS^E	1100	0	-0.45
		$\Delta \bar{S}_{Cu}^E$	1100	-6.904	-2.829
{Mg-In}	{Mg}{In}	ΔS^E	923	0	+0.053
		$\Delta \bar{S}_{In}^E$	923	+1.643	-0.315
{Mg-Li}	{Mg}{Li}	ΔS^E	1000	0	-0.12
		$\Delta \bar{S}_{Li}^E$	1000	-0.827	-1.388
{Mg-Pb}	{Mg}{Pb}	ΔS^E	973	0	+0.136
		$\Delta \bar{S}_{Pb}^E$	973	+3.446	-0.150
{Mg-Sb}	{Mg}{Sb}	ΔS^E	1100	0	-2.61
		$\Delta \bar{S}_{Sb}^E$	1100	—	-17.40
{Mg-Tl}	{Mg}{Tl}	ΔS^E	923	0	-0.029
		$\Delta \bar{S}_{Tl}^E$	923	+0.433	-0.45
{Mg-Zn}	{Mg}{Zn}	ΔS^E	923	0	-0.252
		$\Delta \bar{S}_{Zn}^E$	923	-2.04	-1.85

binary metallic systems (contd.)
element named in the first column)
excess Gibbs energies of solution in cal/g-atom (contd.)

0-3	0-5	0-7	0-9	Ref.
-1900	-1710	-1120	-400	963
-2360	-610	-100	-15	963
-1066	-1322	-1008	-340	99
-2875	-1230	-182	+17	99
-1102	-1341	-1123	-460	99
-2605	-1401	-441	-36	99
-1933	-3131	-2865	—	99
-4642	-3056	-1327	—	99
-1620	-1642	-1132	-432	99
-3435	-755	-220	-28	99
-1102	-1283	-857	-261	99
-3002	-786	-11	+26	99
—	—	—	—	99
-2290	-2244	-1470	-495	99
-4555	-931	-69	0	99
-12,600	-11,000	-5100	-1650	962
-25,700	+12,200	+600	-20	962
-3290	-3385	-2410	-852	99
-6095	-2070	-393	-7	99
-2660	-3007	-2412	-1080	99
-3092	-700	0	+28	99
-1160	-1525	-1400	-690	963
-2820	-1920	-810	-155	963

excess entropies of solution in cal/deg g-atom

-0.195	-0.198	-0.106	+0.001	99
-0.396	-0.073	+0.076	+0.029	99
-2.265	-2.025	-1.185	-0.455	962
-2.74	-2.075	+0.23	-0.115	962
-0.64	-0.575	-0.375	-0.13	963
-0.88	-0.18	-0.03	0	963
-0.254	-0.31	-0.145	+0.022	99
-0.796	-0.142	+0.183	+0.051	99
-0.225	-0.250	-0.210	-0.090	99
-0.361	-0.250	-0.090	-0.010	99
-0.698	-0.772	-0.687	—	99
-1.109	-0.819	-0.394	—	99
-0.169	-0.098	+0.084	+0.097	99
-0.737	+0.447	+0.226	+0.065	99
-0.338	-0.183	-0.198	-0.238	99
-0.599	+0.740	+0.621	+0.104	99
-0.149	-0.138	-0.055	-0.047	99
-0.876	+0.065	-0.015	-0.028	99
-5.36	-2.94	-0.40	+0.05	962
-0.70	+6.19	+0.97	+1.01	962
-0.052	+0.174	+0.282	+0.183	99
+0.53	+0.63	+0.325	+0.052	99
-0.515	-0.665	—	-0.285	963
-1.29	-0.86	-0.32	-0.05	963

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F9z. Na. Sodium alloys: partial and integral heats or

System	Components	Thermo-chemical function	Temp. (°K)	$N_2 =$	
				0-0	0-1
{Na-Bi}	{Na} {Bi}	ΔH	1173	0	-3980
	{Bi}	$\Delta \bar{H}_{Bi}$	1173		-43,600
{Na-Cd}	{Na} {Cd}	ΔH	673	0	-34
	{Cd}	$\Delta \bar{H}_{Cd}$	673	-55	-644
{Na-Cs}	{Na} {Cs}	ΔH	384	0	+145
	{Cs}	$\Delta \bar{H}_{Cs}$	384	+1170	+855
{Na-Ga}	{Na} {Ga}	ΔG^E	823	0	+262
	{Ga}	$\Delta \bar{G}_{Ga}^E$	823	-	+1150
{Na-Hg}	{Na} {Hg}	ΔH	648	0	-1250
	{Hg}	$\Delta \bar{H}_{Hg}$	648	-11,800	-12,880
{Na-In}	{Na} {In}	ΔH	713	0	-448
	{In}	$\Delta \bar{H}_{In}$	713	-4200	-4665
{Na-K}	{Na} {K}	ΔH	384	0	+76
	{K}	$\Delta \bar{H}_K$	384	+870	+650
{Na-Pb}	{Na} {Pb}	ΔH	700	0	-1614
	{Pb}	$\Delta \bar{H}_{Pb}$	700	-15,500	-16,500
{Na-Rb}	{Na} {Rb}	ΔH	384	0	+143
	{Rb}	$\Delta \bar{H}_{Rb}$	384	+1560	+1115
{Na-Sn}	{Na} {Sn}	ΔH	773	0	-1600
{Na-Tl}	{Na} {Tl}	ΔH	673	0	-783
	{Tl}	$\Delta \bar{H}_{Tl}$	673	-8000	-7606

F9β. Na. Sodium alloys: partial and integral

{Na-Bi}	{Na} {Bi}	ΔS^E	1173	0	-1.165
	{Bi}	$\Delta \bar{S}_{Bi}^E$	1173	0	-15.70
{Na-Cd}	{Na} {Cd}	ΔS^E	673	0	-0.16
	{Cd}	$\Delta \bar{S}_{Cd}^E$	673	-1.73	-1.594
{Na-Cs}	{Na} {Cs}	$\Delta S^E, \Delta \bar{S}^E$	384	0-0	0-0
{Na-Hg}	{Na} {Hg}	ΔS^E	648	0	-0.66
	{Hg}	$\Delta \bar{S}_{Hg}^E$	648	-5.22	-7.64
{Na-In}	{Na} {In}	ΔS^E	713	0	-0.50
	{In}	$\Delta \bar{S}_{In}^E$	713	-5.60	-4.492
{Na-K}	{Na} {K}	ΔS^E	384	0	0-0
	{K}	$\Delta \bar{S}_K^E$	384	0-0	0-0
{Na-Pb}	{Na} {Pb}	ΔS^E	700	0	-0.703
	{Pb}	$\Delta \bar{S}_{Pb}^E$	700	-5.814	-8.14
{Na-Rb}	{Na} {Rb}	$\Delta S^E, \Delta \bar{S}^E$	384	0-0	0-0
{Na-Sn}	{Na} {Sn}	ΔS^E	773	0	-0.785
{Na-Tl}	{Na} {Tl}	ΔS^E	673	0	-0.388
	{Tl}	$\Delta \bar{S}_{Tl}^E$	673	-4.306	-3.492

F10z. Ni. Nickel alloys: partial and integral heats or

{Ni-Al}	{Ni} {Al}	ΔH	298	0	-3650
	{Al}	ΔG^E	1273	0	-3025
	{Al}	$\Delta \bar{G}_{Al}^E$	1273	-34,640	-26,230
{Ni-Au}	{Ni} {Au}	ΔH	1150	0	+643
	{Au}	$\Delta \bar{H}_{Au}$	1150	+6620	+6174
{Ni-Au}	{Ni} {Au}	ΔH	1369	0	-
Ni-Co				this system is nearly ideal in	

binary metallic systems (contd.)
element named in the first column)
excess Gibbs energies of solution in cal/g-atom

0-3	0-5	0-7	0-9	Ref.
-9880	-7260	-4360	-1075	971
-2030	-1910	+750	+250	971
-291	-750	-1101	-739	99
-1597	-1890	-1296	-160	99
+238	+219	+148	+52	971
+378	+88	+16	+3	971
+300	+72	-210	-208	971
-227	-698	-480	-82	971
-3870	-6080	-6070	-2010	99
-12,900	-10,130	-1900	0	99
-1373	-2025	-1766	-672	99
-4350	-3000	-461	-32	99
+162	+177	+134	+51	971
+330	+135	+36	+2	971
-3916	-3883	-2688	-931	99
-6636	-2065	-325	0	99
+284	+294	+217	+80	971
+503	+198	+49	+3	971
-4180	-4630	-2890	-845	971
-2106	-2735	-2188	-804	99
-5826	-2847	-598	-8	99

excess entropies of solution in cal/deg g-atom

-3.195	-1.445	-0.315	+0.435	971
+4.77	+0.80	+1.65	+0.37	971
-0.50	-0.902	-1.108	-0.692	99
-1.808	-1.724	-1.09	-0.12	99
0-0	0-0	0-0	0-0	971
-2.51	-4.46	-4.74	-1.01	99
-9.59	-8.89	-0.29	+0.27	99
-1.19	-1.56	-1.272	-0.435	99
-2.973	-2.203	-0.079	0-0	99
0-0	-0.05	-0.11	-0.11	971
-0.13	-0.19	-0.16	-0.095	971
-1.774	-1.409	-0.753	-0.199	99
-1.667	+0.10	+0.231	+0.027	99
0-0	0-0	0-0	0-0	971
-2.055	-2.22	-1.225	-0.505	971
-0.917	-1.064	-0.642	-0.12	99
-2.206	-0.571	+0.205	+0.07	99

excess Gibbs energies of solution in cal/g-atom

-	-14,050	-	-	99
-	-11,205	-	-	99
-	-9815	-	-	99
+1608	+1807	+1347	+500	99
+3692	+1378	+309	+18	99
-	+514	+432	+185	99
the solid and liquid states				960

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F10 α . Ni. Nickel alloys: partial and integral heats or

System	Components	Thermo- chemical function	Temp. (°K)	$N_2 =$	
				0-0	0-1
<Ni-Cr>	<Ni><Cr>	ΔH	—	0	-210
	<Cr>	$\Delta \bar{H}_{Cr}$	—	-4200	-210
	{Ni} {Cr}	ΔG_{Cr}^E	—	0	-335
<Ni-Cu>	<Cr>	ΔG_{Cr}^E	—	-3675	-3037
	<Ni><Cu>	ΔH	—	0	+285
	<Cu>	$\Delta \bar{H}_{Cu}$	—	+3940	+2070
{Ni-Cu}	{Ni} {Cu}	ΔG_{Cu}^E	—	0	+315
	{Cu}	ΔG_{Cu}^E	—	+3500	+2830
	<Ni><Fe> γ	ΔH	1200	0	-496
<Ni-Fe> γ	<Fe> γ	$\Delta \bar{H}_{Fe}$	1200	-5800	-4200
	{Ni} {Fe}	ΔH	1873	0	-580
	{Fe}	$\Delta \bar{H}_{Fe}$	—	-7700	-5413
{Ni-Ge}	<Ni> {Ge}	ΔH	1287	0	—
	<Ni> {Mn} β	ΔH	1050	0	-1295
	<Mn> β	$\Delta \bar{H}_{Mn}$	1050	-14,375	-11,685
<Ni-Pd>	<Ni> {Pd}	ΔH	1273	0	+131
	<Pd>	$\Delta \bar{H}_{Pd}$	1273	+2024	+730
	{Ni} {Pd}	ΔH	1873	0	+163
{Ni-Pd}	{Pd}	$\Delta \bar{H}_{Pd}$	1873	+2790	+994
	<Ni> {Pt}	ΔH	298	0	-651
	<Ni> {Pt}	ΔG^E	1625	0	-852
<Ni-Pt>	<Pt>	ΔG_{Pt}^E	1625	-9780	-7423
	{Ni} {Si}	ΔH	1873	0	-4490
	{Si}	$\Delta \bar{H}_{Si}$	1873	-45,000	-44,700
{Ni-Sn}	{Ni} {Sn}	ΔH	1773	0	-2500
	<Ni> {Zn}	ΔG^E	1100	0	-873
	<Zn>	ΔG_{Zn}^E	1100	-9314	-8167

F10 β . Ni. Nickel alloys: partial and integral

<Ni-Au>	<Au> {Ni}	ΔS^E	1150	0	+0.161
	<Au>	$\Delta \bar{S}_{Au}^E$	1150	+1.14	+1.957
<Ni-Cr>	<Ni> {Cr}	ΔS^E	—	0	+0.087
	<Cr>	$\Delta \bar{S}_{Cr}^E$	—	-0.675	+0.740
<Ni-Cu>	<Ni> {Cu}	ΔS^E	—	0	-0.01
	<Cu>	$\Delta \bar{S}_{Cu}^E$	—	+1.123	-0.485
<Ni-Fe>	<Ni> {Fe}< γ	ΔS^E	1200	0	-0.134
	<Fe> γ	$\Delta \bar{S}_{Fe}^E$	1200	-1.2	-0.788
{Ni-Fe}	{Ni} {Fe}	ΔS^E	1873	0	-0.178
	{Fe}	$\Delta \bar{S}_{Fe}^E$	1873	-2.2	-1.40
<Ni-Mn> γ	<Ni> {Mn}< β	ΔS^E	1050	0	-0.166
	<Mn> β	$\Delta \bar{S}_{Mn}^E$	1050	-1.700	-1.652
<Ni-Pd>	<Ni> {Pd}	ΔS^E	1273	0	+0.166
	<Pd>	$\Delta \bar{S}_{Pd}^E$	1273	+1.875	+1.475
{Ni-Pd}	{Ni} {Pd}	ΔS^E	1873	0	-0.003
	{Pd}	$\Delta \bar{S}_{Pd}^E$	1873	+0.455	-0.259
<Ni-Pt>	<Ni> {Pt}	ΔS^E	1625	0	+0.124
	{Ni} {Si}	ΔS^E	1873	0	-0.65
{Ni-Si}	{Si}	$\Delta \bar{S}_{Si}^E$	1873	-5.50	-7.48

* Assuming ΔC_p (298-1625°K) = 0.

binary metallic systems (contd.)
element named in the first column)
excess Gibbs energies of solution in cal/g-atom (contd.)

					Ref.
0-3	0-5	0-7	0-9		
+ 336	+ 1520	+ 2148	+ 1163		968
+ 3740	+ 4970	+ 2014	+ 224		968
- 742	- 653	- 410	- 337		968
- 1300	- 81	- 220	- 305		968
+ 465	+ 445	+ 340	+ 130		949
+ 605	+ 290	+ 110	+ 3		949
+ 735	+ 835	+ 680	+ 270		949
+ 1715	+ 835	+ 300	+ 30		949
- 1000	- 885	- 465	- 230		972
- 1140	- 340	+ 240	- 140		972
- 1160	- 1100	- 700	- 245		972
- 1732	- 475	- 4	- 13		972
—	- 13,090	- 8650	- 2950		966
- 3100	- 3397	- 1632	—		99
- 7057	- 1830	+ 1120	—		99
+ 84	- 128	- 282	- 202		99
- 526	- 664	- 384	- 67		99
+ 255	+ 286	+ 236	+ 101		99
+ 463	+ 268	+ 98	+ 12		99
- 1867	- 2214	- 1730	- 762		99
- 1860	- 2060	- 1601	- 631		99
- 3887	- 1675	- 492	- 42		99
- 12,640	- 13,230	- 8780	- 3050		954
- 33,500	- 5600	- 820	- 40		954
- 4400	- 4100	- 2500	- 1100		99
- 2156	- 2996 β	—	—		—
- 5468	- 3485 β	—	—		—

excess entropies of solution in cal/deg g-atom

+0.561	+0.668	+0.458	+0.139	99
+1.575	+0.483	+0.006	-0.014	99
+0.429	+0.967	+1.163	+0.662	968
+2.108	+2.438	+1.006	+0.326	968
-0.153	-0.231	-0.19	-0.085	949
-0.61	-0.235	-0.07	-0.016	949
-0.248	-0.194	0.069	-0.059	972
-0.21	-0.12	+0.085	-0.099	972
-0.296	-0.264	-0.154	-0.051	972
-0.34	-0.10	+0.02	0.0	972
-0.55	-0.494	+0.291	—	99
-1.526	+0.80	+1.50	—	99
+0.376	+0.427	+0.33	+0.118	99
+0.827	+0.367	+0.079	-0.002	99
-0.067	-0.085	-0.067	-0.026	99
-0.214	-0.079	-0.02	-0.001	99
-0.004	-0.095	-0.079	-0.081	99*
-2.45	-2.77	-1.84	-0.55	954
-8.00	-1.54	-0.04	+0.08	954

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F11 α . Pb. Lead alloys: partial and integral heats or

System	Components	Thermo- chemical function	Temp. (°K)	$N_2 =$	
				0-0	0-1
{Pb-Ag}	{Pb}{Ag}	ΔH	1273	0	+274
		$\Delta \bar{H}_{Ag}$	1273	+2800	+2640
{Pb-Al}	{Pb}{Al}	ΔH	—	0	+584
		$\Delta \bar{H}_{Al}$	—	—	—
{Pb-Au}	{Pb}{Au}	ΔH	1200	0	+62
		$\Delta \bar{H}_{Au}$	1200	+53	-114
{Pb-Bi}	{Pb}{Bi}	ΔH	700	0	-80
		$\Delta \bar{H}_{Bi}$	700	-840	-780
{Pb-Cd}	{Pb}{Cd}	ΔH	773	0	+205
		$\Delta \bar{H}_{Cd}$	773	+2230	+1886
{Pb-Cu}	{Pb}{Cu}	ΔH	1473	0	+584
		$\Delta \bar{H}_{Cu}$	1473	+6600	+5184
{Pb-Ga}	{Pb}{Ga}	ΔH	923	0	+391
		$\Delta \bar{H}_{Ga}$	923	+4830	+3180
{Pb-Hg}	{Pb}{Hg}	ΔH	600	0	-34
		$\Delta \bar{H}_{Hg}$	600	-555	-173
<Pb-In>	<In><Pb>	ΔH	315	0	+100
		$\Delta \bar{H}_{In}$	315	—	—
{Pb-In}	{Pb}{In}	ΔH	673	0	+78
		$\Delta \bar{H}_{In}$	673	+956	+711
{Pb-K}	{Pb}{K}	ΔH	848	0	-1232
		$\Delta \bar{H}_{K}$	848	-12,316	-12,168
{Pb-Mg}	{Pb}{Mg}	ΔH	973	0	-495
		$\Delta \bar{H}_{Mg}$	973	-5000	-4950
{Pb-Na}	{Pb}{Na}	ΔH	700	0	-931
		$\Delta \bar{H}_{Na}$	700	-9200	-9330
{Pb-Pt}	{Pb}{Pt}	ΔG^E	1273	0	-725
		$\Delta \bar{G}^E_{Pt}$	1273	-7958	-6610
{Pb-Sb}	{Pb}{Sb}	ΔH	905	0	0
		$\Delta \bar{H}_{Sb}$	905	+32	-18
{Pb-Sn}	{Pb}{Sn}	ΔH	1050	0	+130
		$\Delta \bar{H}_{Sn}$	1050	+1500	+1118
<Pb-Tl>	<Pb><Tl> β	ΔH	523	0	-112
		$\Delta \bar{H}_{Tl}$	523	-1170	-1075
{Pb-Tl}	{Pb}{Tl}	ΔH	773	0	-78
		$\Delta \bar{H}_{Tl}$	773	-820	-744
{Pb-Zn}	{Pb}{Zn}	ΔH	—	0	+535
		$\Delta \bar{H}_{Zn}$	—	—	+5010

F11 β . Pb. Lead alloys: partial and integral

{Pb-Ag}	{Pb}{Ag}	ΔS^E	1273	0	+0.093
		$\Delta \bar{S}^E_{Ag}$	1273	+0.792	+1.025
{Pb-Au}	{Pb}{Au}	ΔS^E	1200	0	+0.261
		$\Delta \bar{S}^E_{Au}$	1200	+2.345	+1.769
{Pb-Bi}	{Pb}{Bi}	ΔS^E	700	0	+0.02
		$\Delta \bar{S}^E_{Bi}$	700	+0.26	+0.20
{Pb-Cd}	{Pb}{Cd}	ΔS^E	773	0	+0.046
		$\Delta \bar{S}^E_{Cd}$	773	+0.466	+0.449
{Pb-Cu}	{Pb}{Cu}	ΔS^E	1473	0	+0.110
		$\Delta \bar{S}^E_{Cu}$	1473	+1.334	+0.918
{Pb-Hg}	{Pb}{Hg}	ΔS^E	600	0	-0.10
		$\Delta \bar{S}^E_{Hg}$	600	-1.18	-0.875
{Pb-In}	{Pb}{In}	ΔS^E	673	0	+0.059
		$\Delta \bar{S}^E_{In}$	673	+0.826	+0.49

binary metallic systems (contd.)
element named in the first column)
excess Gibbs energies of solution in cal/g-atom

0-3	0-5	0-7	0-9	Ref.
+ 711	+ 885	+ 696	+ 252	99
+ 1855	+ 891	+ 174	+ 1	99
+ 1593	+ 2236	+ 2129	+ 924	99
- 73	- 167	- 189	- 104	99
- 550	- 311	- 153	- 35	99
- 210	- 265	- 215	- 80	99
- 550	- 265	- 70	- 5	99
+ 502	+ 635	+ 585	+ 297	99
+ 1262	+ 751	+ 353	+ 69	99
+ 1338	+ 1607	+ 1422	+ 707	99
+ 3121	- 1670	+ 824	+ 143	99
+ 788	+ 916	+ 857	+ 450	970
+ 1595	+ 1018	+ 576	+ 103	970
- 18	+ 47	+ 111	+ 92	99
+ 156	+ 230	+ 174	+ 37	99
+ 250	+ 310	+ 270 β	0	99
+ 186	+ 227	+ 195	+ 85	99
+ 449	+ 239	+ 90	+ 10	99
- 3432	- 4722	- 4229	- 1487	99
- 9859	- 7000	- 1252	+ 62	99
- 1470	- 2244	- 2289	- 945	99
- 4738	- 3556	- 1318	- 35	99
- 2688	- 3883	- 3916	- 1614	99
- 8200	- 5700	- 2750	+ 40	99
- 1745	- 2141	—	—	99
- 4292	- 2205	—	—	99
- 8	- 16	- 12	- 2	99
- 45	- 22	+ 3	+ 2	99
+ 285	+ 327	+ 274	+ 120	99
+ 615	+ 312	+ 122	+ 15	99
- 313	- 463	- 494	—	99
- 950	- 700	- 414	—	99
- 200	- 252	- 211	- 88	99
- 520	- 268	- 86	- 8	99
+ 1360	+ 1800	+ 1745	+ 930	161
+ 3605	+ 2340	+ 1140	+ 180	161

excess entropies of solution in cal/deg g-atom

+0.305	+0.438	+0.375	+0.161	99
+1.003	+0.531	+0.152	+0.031	99
+0.396	+0.425	+0.357	+0.153	99
+0.565	+0.425	+0.153	+0.017	99
+0.05	+0.05	+0.04	+0.03	99
+0.10	+0.04	+0.03	+0.01	99
+0.124	+0.170	+0.174	+0.111	99
+0.345	+0.235	+0.143	+0.042	99
+0.225	+0.252	+0.234	+0.173	99
+0.461	+0.223	+0.216	+0.071	99
-0.23	-0.278	-0.234	-0.11	99
-0.543	-0.285	-0.098	-0.025	99
+0.119	+0.123	+0.084	+0.031	99
+0.221	+0.076	+0.009	0.0	99

Table F. Thermochemical data of
(N_2 is the atomic fraction of the second
F11 β . Pb. Lead alloys: partial and integral

System	Components	Thermo- chemical function	Temp. (°K)	$N_2 =$	
				0-0	0-1
{Pb-K}	{Pb}{K}	ΔS^E	848	0	-0.447
		ΔS^E_{K}	848	-4.50	-4.415
{Pb-Mg}	{Pb}{Mg}	ΔS^E	973	0	-0.047
		ΔS^E_{Mg}	973	-0.925	-0.216
{Pb-Na}	{Pb}{Na}	ΔS^E	700	0	-0.199
		ΔS^E_{Na}	700	-1.714	-2.231
{Pb-Sb}	{Pb}{Sb}	ΔS^E	905	0	+0.045
		ΔS^E_{Sb}	905	+0.533	+0.383
{Pb-Sn}	{Pb}{Sn}	ΔS^E	1050	0	-0.184
		ΔS^E_{Sn}	1050	-2.385	-1.401
{Pb-Tl}	{Pb}{Tl}	ΔS^E	523	0	-0.138
		ΔS^E_{Tl}	523	-1.663	-1.157
{Pb-Tl}	{Pb}{Tl}	ΔS^E	773	0	-0.055
		ΔS^E_{Tl}	773	-0.608	-0.49
{Pb-Zn}	{Pb}{Zn}	ΔS^E	—	0	+0.185
		ΔS^E_{Zn}	—	+2.2	+1.745

F12x. Pt. Platinum alloys: partial and integral heats or

{Pt-Au}	{Pt}{Au}	ΔH	—	0	+455
		ΔH_{Au}	—	+5690	+3585
{Pt-Co}	{Pt}{Co}	ΔG^E	1273	0	-1067
		ΔG^E_{Co}	1273	-11,860	-9607
{Pt-Cr}	{Pt}{Cr}	ΔG^E	1773	0	-3140
		ΔG^E_{Cr}	1773	-35,100	-28,100
{Pt-Cu}	{Pt}{Cu}	ΔH	1350	0	-690
		ΔH_{Cu}	1350	-6870	-6844
{Pt-Fe}	{Pt}{Fe}	ΔG^E	1123	0	-1590
		ΔG^E_{Fe}	1123	-15,914	-15,914
{Pt-Ni}	{Pt}{Ni}	ΔG^E	1625	0	-631
		ΔH	298	0	-762
{Pt-Pd}	{Pt}{Pd}	ΔG^E_{Ni}	1625	-6700	-5926
		ΔH	—	0	-292
		ΔH_{Pd}	—	-3020	-2805

F12 β . Pt. Platinum alloys: partial and integral

{Pt-Au}	{Pt}{Au}	ΔS^E	—	0	-0.105
		ΔS^E_{Au}	—	-0.90	-1.15
{Pt-Cu}	{Pt}{Cu}	ΔS^E	1350	0	+0.039
		ΔS^E_{Cu}	1350	+0.926	-0.042
{Pt-Ni}	{Pt}{Ni}	ΔS^E	1625	0	-0.081
		ΔS^E_{Ni}	—	0	-0.164
{Pt-Pd}	{Pt}{Pd}	ΔS^E	—	0	-1.57
		ΔS^E_{Pd}	—	-1.70	—

* ΔH measured at 298°K; $\Delta Cp = 0$, assumed.

binary metallic systems (contd.)
element named in the first column)
excess entropies of solution in cal/deg g-atom (contd.)

0-3	0-5	0-7	0-9	Ref.
-1.311	-2.123	-2.339	-0.814	99
-4.141	-5.00	-0.914	+0.067	99
-0.055	-0.138	-0.149	+0.136	99
-0.149	-0.340	+0.162	+0.168	99
-0.753	-1.409	-1.774	-0.703	99
-3.049	-2.917	-1.82	+0.123	99
+0.095	+0.106	+0.091	+0.043	99
+0.194	+0.099	+0.048	+0.007	99
-0.304	-0.244	-0.135	-0.035	99
-0.312	+0.01	+0.035	+0.007	99
-0.298	-0.358	-0.329	—	99
-0.654	-0.340	-0.226	—	99
-0.119	-0.130	-0.10	-0.062	99
-0.236	-0.098	-0.039	-0.035	99
+0.475	+0.66	+0.685	+0.405	161
+1.32	+0.94	+0.49	+0.07	161

excess Gibbs energies of solution in cal/g-atom

+795	+632	+265	0	958
+930	-160	-285	-60	958
-2490	-2965	-2490	-1067	99
-5811	-2965	-1067	-119	99
-7260	—	—	—	964
-16,650	—	—	—	964
-1980	-2650	-2482	-1228	99
-6044	-3130	-1540	-234	99
-3276 γ_3	-4344 γ_2	-3342	-1368	99
-8924 γ_3	-4166 γ_2	-929	-450	99
-1600	-2060	-1860	-852	99
-1730	-2214	-1867	-651	99
-4190	-2445	-990	-122	99
-773	-1032	-960	-451	958
-2130	-1310	-550	-70	958

excess entropies of solution in cal/deg g-atom

-0.35	-0.55	-0.58	-0.29	958
-1.205	-0.875	-0.41	-0.057	958
-0.125	-0.209	-0.179	-0.096	99
-1.034	-0.089	-0.106	-0.027	99
-0.079	-0.095	-0.004	+0.124	99*
-0.432	-0.595	-0.533	-0.250	958
-1.19	-0.725	-0.305	-0.04	958