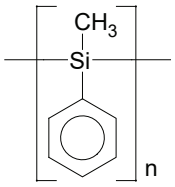
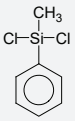
PMPS polymethylphenylsilylene

PARAMETER	UNIT	VALUE	REFERENCES
GENERAL			
Common name	-	polymethylphenylsilylene	
CAS name	-	poly(methylphenylsilylene)	
Acronym	-	PMPS	
CAS number	-	76188-55-1	
Formula			
HISTORY			
Person to discover	-	Yajima, S; Okamura, K; Hasegawa, Y	Yajima, S; Okamura, K; Hasegawa, Y, US Patent 4,220,600, The Research Institute for Special Inorganic Materials, Sept. 2, 1980.
Date	-	1980	
SYNTHESIS			
Monomer(s) structure	-		
Monomer(s) CAS number(s)	-	149-74-6	
Monomer(s) molecular weight(s)	dalton, g/mol, amu	191.13	
Method of synthesis	-	thermal reductive coupling of the corresponding dichlorosilane with a dispersion of sodium in toluene	Demoustier-Champagne, S; Cordier, S; Devaux, J, Polymer, 36, 5, 1003-7, 1995.
Number average molecular weight, M_n	dalton, g/mol, amu	4,250-283,000	Demoustier-Champagne, S; Cordier, S; Devaux, J, Polymer, 36, 5, 1003-7, 1995.
Mass average molecular weight, M_w	dalton, g/mol, amu	28,500-653,000	Demoustier-Champagne, S; Cordier, S; Devaux, J, Polymer, 36, 5, 1003-7, 1995.
Polydispersity, M_w/M_n	-	2.3-23.1	Demoustier-Champagne, S; Cordier, S; Devaux, J, Polymer, 36, 5, 1003-7, 1995.
PHYSICAL PROPERTIES			
Density at 20°C	g cm^{-3}	1.08-1.12	
Color	APHA	40	
Refractive index, 20°C	-	1.69	Sato, T; Nagayama, N; Yokoyama, M, J. Photopolym. Sci. Technol., 16, 5, 679-84, 2003.
Melting temperature, DSC	°C	35	
Decomposition temperature	°C	200	
Thermal conductivity, melt	W m^{-1} K^{-1}	0.147	
Glass transition temperature	°C	-37 to -21	
Specific heat capacity	J K^{-1} kg^{-1}	1.52	

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PARAMETER	UNIT	VALUE	REFERENCES
Maximum service temperature	°C	-70 to 260	
Surface tension	mN m^{-1}	26.1-28.5	
Dielectric constant at 100 Hz/1 MHz	-	2.98/2.98	
Dissipation factor at 100 Hz		13E-4	
Dissipation factor at 1 MHz		10E-4	
Volume resistivity	ohm-m	1E11	
Speed of sound	m s^{-1}	1372	
CHEMICAL RESISTANCE			
Alcohols	-	good	
Aromatic hydrocarbons	-	poor	
Esters	-	poor	
Halogenated hydrocarbons	-	poor	
Ketones	-	poor	
Θ solvent	-	diisobutylamine	
Good solvent	-	acetone (hot), chloroform, diethyl ether, ethyl acetate, toluene	
Non-solvent	-	ethanol, ethylene glycol, methanol, n-propanol	
FLAMMABILITY			
Ignition temperature	°C	302	
Autoignition temperature	°C	487	
WEATHER STABILITY			
Spectral sensitivity	nm	194, 259, 264, 266, 270, 280, 332, 334, 355	Schauer, F; Kuritka, I; Saha, P; Nespurek, S, J. Pys.: Condens. Matter, 19, 076101, 1-11; 2007.
Activation wavelengths	nm	266, 355	
Excitation wavelengths	nm	313	Skryshevskii, Y A, J. appl. Spectroscopy, 71, 5, 671-675, 2004.
Emission wavelengths	nm	355, 415	
BLENDS			
Suitable polymers	-	PS	
ANALYSIS			
FTIR (wavenumber-assignment)	cm^{-1}/-	Si-H – 2100-2150 and 880-890 and 640; Si-C – 1420-1430 and 1090-1120; C-H – 1240-1260 and 1020-1040; Si-O – 1000-1080 and 795-840	Kuritka, I; Horvath, P; Schauer, F; Zemek, J, Polym. Deg. Stab., 91, 2901-10, 2006.