Palg alginic acid

PARAMETER	UNIT	VALUE	REFERENCES
GENERAL			
Common name	-	alginic acid; poly(1,4-α,L-guluronic-co-1,4-β-D-mannuronic acid)	
Acronym	-	Palg	
CAS number	-	9005-32-7	
EC number	-	232-680-1	
RTECS number	-	AZ577500	
Linear formula		$(C_6H_8O_6)_n$	
SYNTHESIS			
Monomer(s) structure	-	β-D-mannuronic acid and α-L-guluronic acid	
Monomer ratio	-	G:M=39/61	Tolentino, A; Alla, A; Martinez de Ilarduya, A; Munoz Guerra, S, Carbohydrate Polym., in press, 2011.
Method of synthesis	-	natural polysaccharide; alginates are extracted from brown algae by firstly converting them to the Na salt by addition of Na_2CO_3. Na alginate is water soluble and extracted from the remaining residue. The soluble Na alginate is then precipitated by addition of an acid which forms alginic acid as a soft gel. The alginic acid is then removed by extraction with alcohol	Ross, A B; Hall, C; Anastasakis, K; Westwood, A; Jones, J M; Crewe, R J, J. Anal. Appl. Pyrolysis, 91, 344-51, 2011.
Mass average molecular weight, M_w	dalton, g/mol, amu	80,000-240,000	Tolentino, A; Alla, A; Martinez de Ilarduya, A; Munoz Guerra, S, Carbohydrate Polym., in press, 2011.
STRUCTURE			
Fibril diameter	nm	6.0	Robitzer, M; Di Renzo, F; Quignard, F, Microporous Mesoporous Mater., 140, 9-16, 2011.
Lamellar spacing	nm	3.5-4.2	
PHYSICAL PROPERTIES			
Density at 20°C	g cm^{-3}	1.79	Robitzer, M; Di Renzo, F; Quignard, F, Microporous Mesoporous Mater., 140, 9-16, 2011.
Color	-	white to light yellow	
pH	-	1.5-3.5	
Refractive index, 20°C	-	1.595-1.69	
MECHANICAL & RHEOLOGICAL PROPERTIES			
Tensile strength	MPa	200 (fiber)	Sa, V; V; Kornev, K G, Carbon, 49, 1859-68, 2011.
Tensile modulus	MPa	3,620 (fiber)	Sa, V; V; Kornev, K G, Carbon, 49, 1859-68, 2011.
Elongation	%	16	
FLAMMABILITY			
Volatile products of combustion	-	CO_2, CO, furfural, phenol, and more	Ross, A B; Hall, C; Anastasakis, K; Westwood, A; Jones, J M; Crewe, R J, J. Anal. Appl. Pyrolysis, 91, 344-51, 2011.

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PARAMETER	UNIT	VALUE	REFERENCES
TOXICITY			
Carcinogenic effect	-	not listed by ACGIH, NIOSH, NTP	
PROCESSING			
Typical processing methods	-	compounding, spraying, spinning	
Applications	-	drug delivery, hydrocolloids, wound dressing	
Outstanding properties	-	biocompatibility, swelling	
BLENDS			
Suitable polymers	-	polylysine; poly(galacturonic acid); PVOH	
ANALYSIS			
FTIR (wavenumber-assignment)	cm^{-1}/-	C-O – 947.9; C-H – 878.1; mannuronic acid residue – 817.1	Gomez-Ordonez, E; Ruperez, P, Food Hydrocolloids, 25, 1514-20, 2011.