PHSQ polyhydridosilsesquioxane

PARAMETER	UNIT	VALUE	REFERENCES
GENERAL			
Common name	-	polyhydridosilsesquioxane, polyhydrosilsesquioxane	
Acronym	-	PHSQ	
SYNTHESIS			
Monomer(s) structure	-	$SiH(OCH_2CH_3)_3$	
Monomer(s) CAS number(s)	-	998-30-1	
Monomer(s) molecular weight(s)	dalton, g/mol, amu	164.28	
Formulation example	-	160 g of triethoxysilane was mixed with 800 g acetone. 11.7 g of water and 14.6 g of 0.02N nitric acid were added to the triethoxysilane/water solution. The final solution was stored at 22°C for 10 days.	Leung, R Y-k; Case, S, US Patent 6,413,882, Allied Signal, 2002.
Temperature of polymerization	°C	22	
Time of polymerization	days	10	
Pressure of polymerization	Pa	atmospheric	
Catalyst	-	nitric acid	
Mass average molecular weight, M_w	dalton, g/mol, amu	2,000-10,000	
PHYSICAL PROPERTIES			
Refractive index, 20°C	-	1.383	
Decomposition temperature	°C	300 (change from cage to ladder structure with releasing hydrogen); PSQ is completely transfomed to SiO_2 at 600°C	
Dielectric constant at 100 Hz/1 MHz	-	3.1	
WEATHER STABILITY			
Absorbance at 157 nm	μm^{-1}	0.01-0.02	Ando, S; Fujigaya, T; Ueda, M, J. Photopolym. Sci. Technol., 15, 4, 231-36, 2002.
PROCESSING			
Typical processing methods	-	spin-coating	
Applications	-	integrated circuits; 157 nm lithography	
Outstanding properties	-	low dielectric properties	
BLENDS			
Suitable polymers	-	PPO	