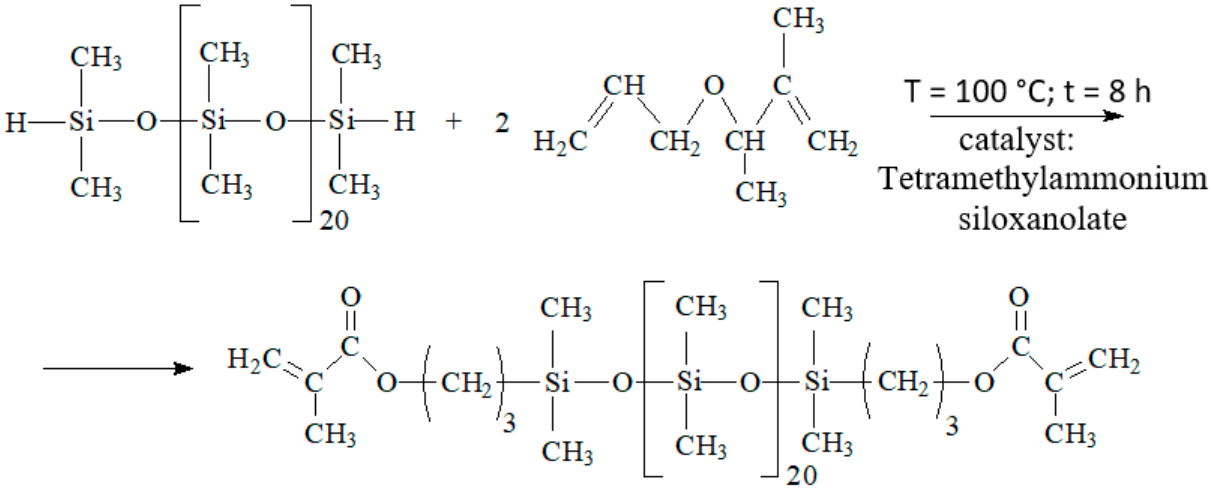
Article

Effect of Molecular Architecture of Surface-Active Organosilicon Macromers on Their Colloidal Properties in Relation to Heterophasic Radical Polymerization of Styrene and Methyl Methacrylate

Synthesis of α, ω - dipropylmethacrylatepolydimethylsiloxane with the number of repeating siloxane units n = 20 (l-SAM)



1 g of polydimethylsiloxane hydride (n = 20) was dissolved in 0.96 g of anhydrous toluene, 0.164 g (5% excess based on GPDMS) of allyl methacrylate and 1.5 μl of Karsted's catalyst were added. The reaction was carried out at T = 60 °C for 12 hours, with vigorous stirring. Then low-boiling components were distilled off at a temperature of 140 °C. The structure of the obtained compound was confirmed by the data of ^{1}H NMR spectroscopy (Figure 1).

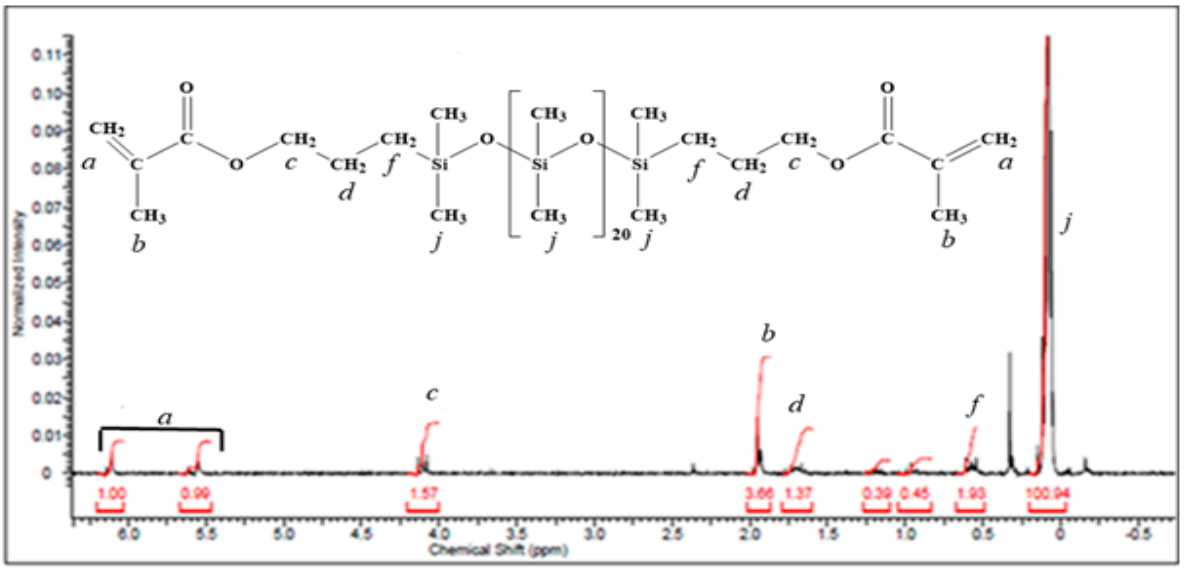
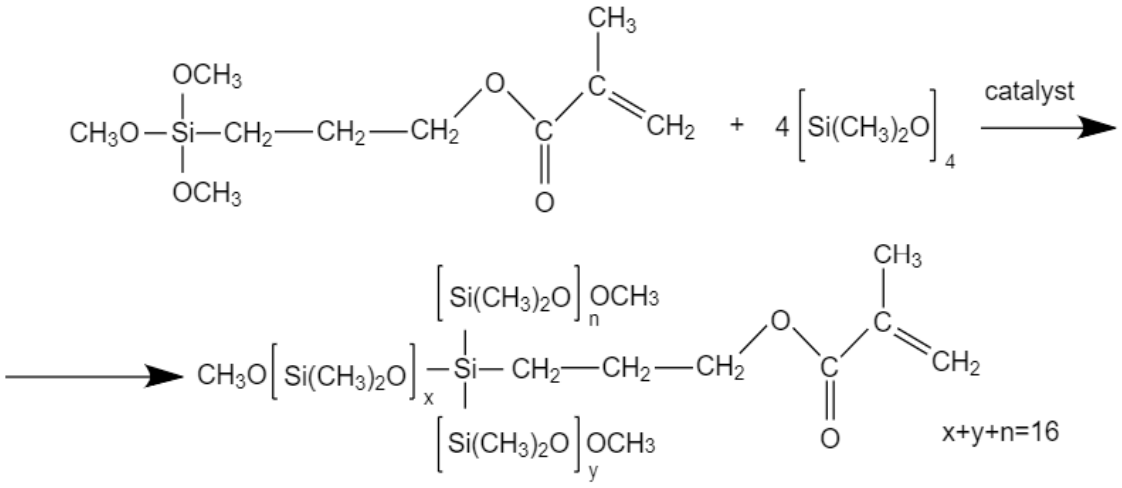


Figure S1. ^{1}H NMR spectrum of α, ω - dipropyl methacrylate polydimethylsiloxane (n = 20).

On the spectrum, the letters from a to j show which peak corresponds to which functional group.

Synthesis of branched γ -methacryloxypropyl containing dimethylsiloxane oligomer (b-SAM)



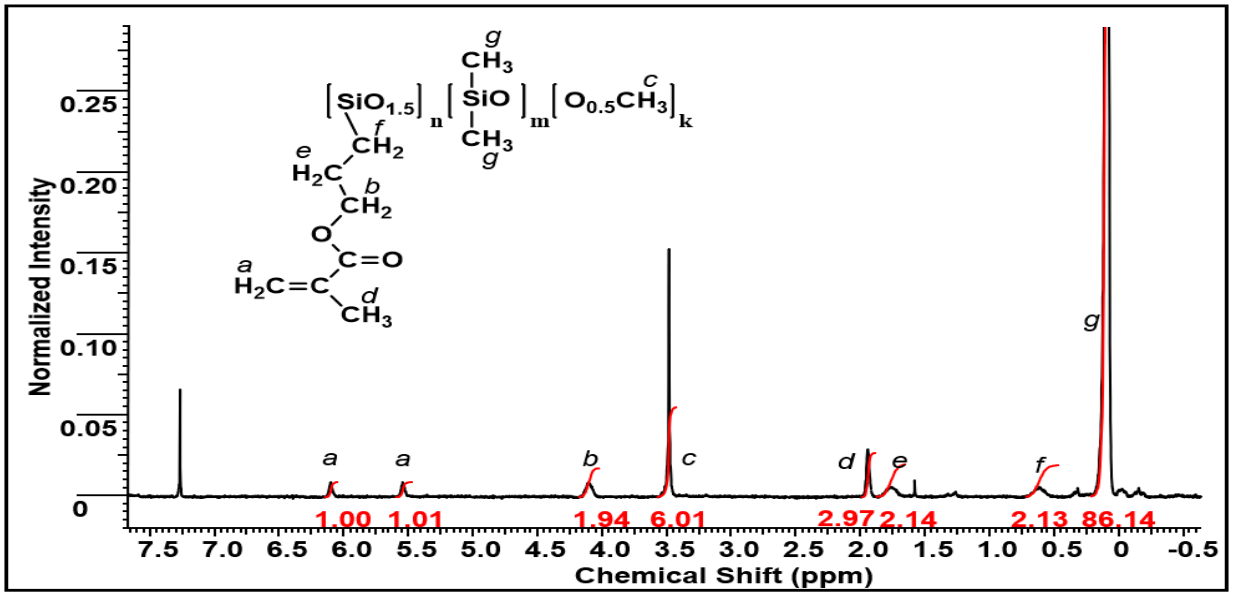


Figure S2. ^{1}H NMR spectrum of branched γ -methacryloxypropyl containing dimethylsiloxane oligomer. On the spectrum, the letters from a to g show which peak corresponds to which functional group.

Synthesis of oligo-(γ-methacryloxypropyl)silsesquioxane (s-SAM)

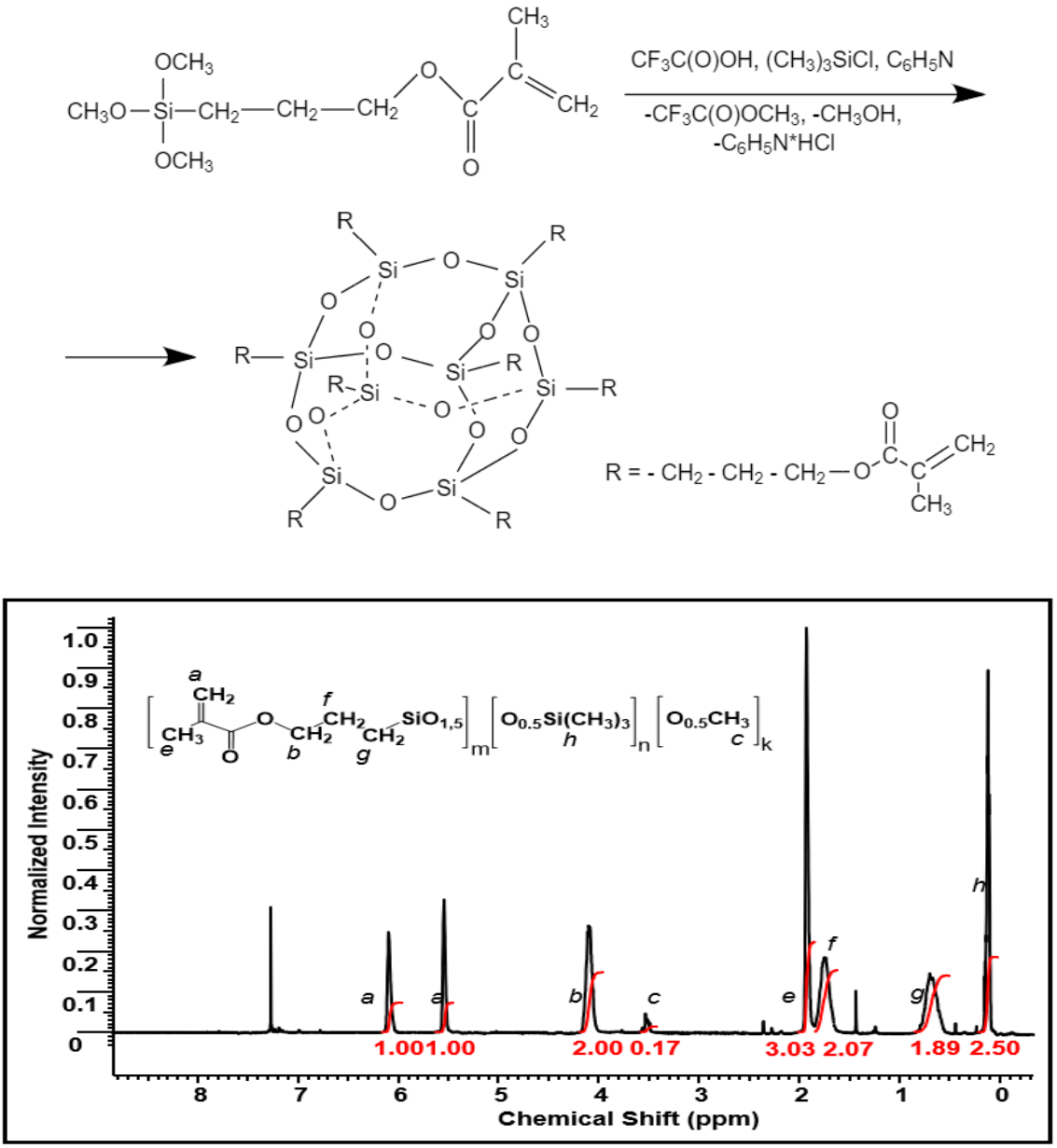


Figure S3. ^{1}H NMR spectrum of oligo-(γ-methacryloxypropyl)silsesquioxane. On the spectrum, the letters from a to h show which peak corresponds to which functional group.

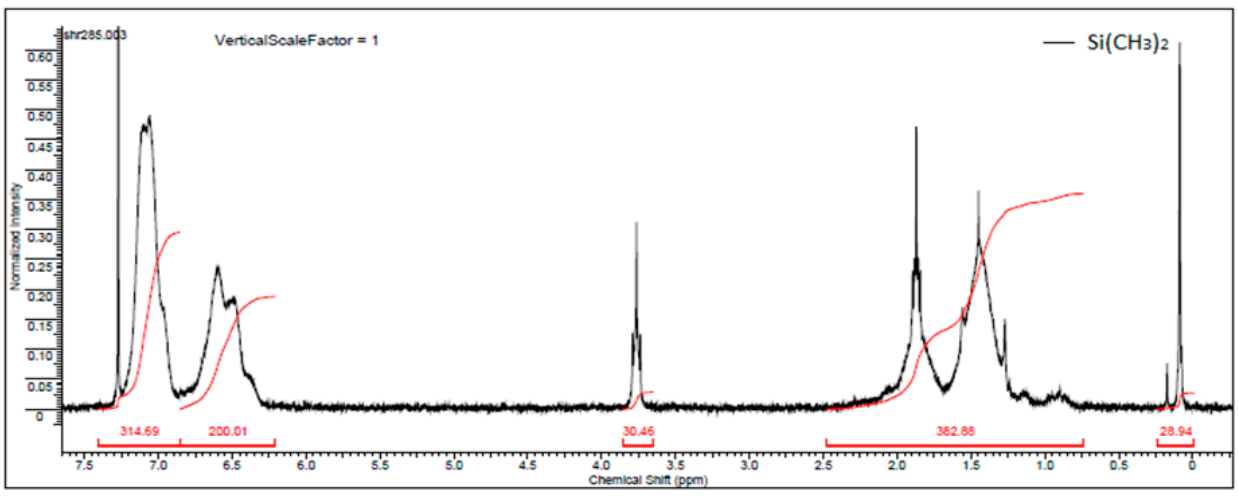


Figure S4. ^{1}H NMR spectrum of high molecular weight fraction of the styrene polymerization product in the presence of SAM.

Size d.nm	Mean Number %	Std Dev Number %
0,4000	0,0	
0,4632	0,0	
0,5365	0,0	
0,6213	0,0	
0,7195	0,0	
0,8332	0,0	
0,9649	0,0	
1,117	0,0	
1,294	0,0	
1,499	0,0	
1,736	0,0	
2,010	0,0	
2,328	0,0	
2,696	0,0	
3,122	0,0	
3,615	0,0	
4,187	0,0	
4,849	0,0	

Size d.nm	Mean Number %	Std Dev Number %
5,615	0,0	
6,503	0,0	
7,531	0,0	
8,721	0,0	
10,10	0,0	
11,70	0,0	
13,54	0,0	
15,69	0,0	
18,17	0,0	
21,04	0,0	
24,36	0,0	
28,21	0,0	
32,67	0,0	
37,84	0,0	
43,82	0,0	
50,75	0,0	
58,77	0,0	
68,06	0,0	

Size d.nm	Mean Number %	Std Dev Number %
78,82	0,0	
91,28	0,0	
105,7	0,0	
122,4	0,0	
141,8	0,0	
164,2	0,0	
190,1	0,0	
220,2	0,0	
255,0	0,0	
295,3	0,0	
342,0	0,0	
396,1	0,0	
458,7	0,0	
531,2	0,0	
615,1	0,0	
712,4	0,0	
825,0	0,0	
955,4	0,0	

Size d.nm	Mean Number %	Std Dev Number %
1106	0,0	
1281	22,0	
1484	47,0	
1718	28,0	
1990	3,0	
2305	0,0	
2669	0,0	
3091	0,0	
3580	0,0	
4145	0,0	
4801	0,0	
5560	0,0	
6439	0,0	
7456	0,0	
8635	0,0	
1,000e4	0,0	

Table S1. The numerical data of the distribution of the diameters of the polystyrene particles obtained in the presence of l-SAM.