Electronic supplementary information

POLYMETHYLSILSESQUIOXANE OLIGOMERS AS ECOLOGICALLY FRIENDLY BINDING AGENTS FOR PARTICLE BOARDS

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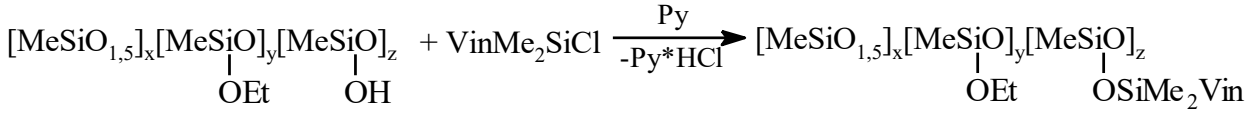
Scheme S1. Hydrolytic polycondensation of trialkoxymethylsilanes.

256.76 g (1.44 mol) of triethoxymethylsilane and 38.91 g (2.16 mol) of deuterated water were placed in a 500 mL stainless steel autoclave equipped with a magnetic stirrer. The mixture was stirred at 570 rpm at 85 °C for 2 h 15 min, after which heating was turned off and stirring was continued until the autoclave cooled down. The structure of the methylsilsesquioxane oligomer was then analyzed by solution sampling, extraction of the oligomer with ethyl acetate and its blocking with chlorodimethylvinylsilane in the presence of pyridine as a hydrogen chloride acceptor.



Scheme S2. Blocking hydroxy groups by silylation reaction.

12.9 mL (0.17 mol) of pyridine, 21.9 mL (0.20 mol) of chlorodimethylvinylsilane and 20 mL of ethyl acetate were placed in a two-neck flask equipped with a magnetic stirrer, a backflow condenser with a $CaCl_2$ tube, and a dropping funnel. A 60 vol % solution of the reaction mixture in ethyl acetate was added under vigorous stirring. The reaction mixture was refluxed under vigorous stirring for 2 h. Then the reaction mixture was cooled to room temperature and washed with distilled water 5–7 times to remove the precipitate of pyridine hydrochloride. The organic layer was separated, dried over anhydrous Na_2SO_4 for 1 day, and evaporated to dryness at 60 °C/150 mbar. The low molecular weight products were removed by distillation on an oil pump

at 80 °C/1 Torr. The product obtained was analyzed by ^{1}H NMR spectroscopy and gel permeation chromatography. ^{1}H NMR (blocked product) ($CDCl_3$): δ 0.07–0.29 (m, Si-$\underline{CH_3}$), 1.15–1.27 (m, $OCH_2\underline{CH_3}$), 3.74–3.94 (m, $O\underline{CH_2}CH_3$), 5.75–6.30 (m, Si-$\underline{CH{=}CH_2}$) ppm. GPC: MW_{peak} = 600 Da, M_w = 870 Da, M_n = 670 Da, M_w/M_n = 1.3.

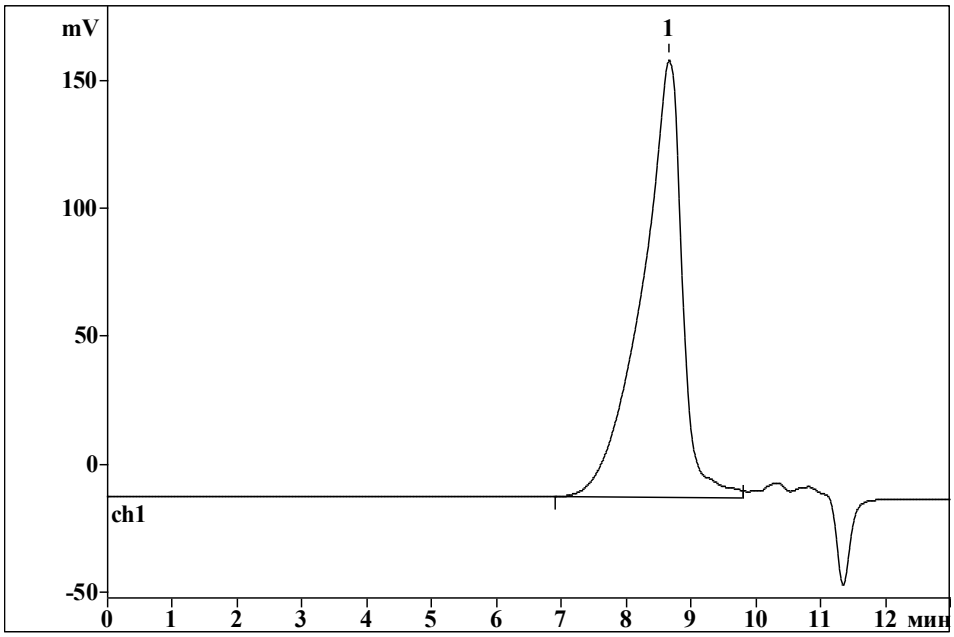


Figure S1. Chromatogram of the blocked product.

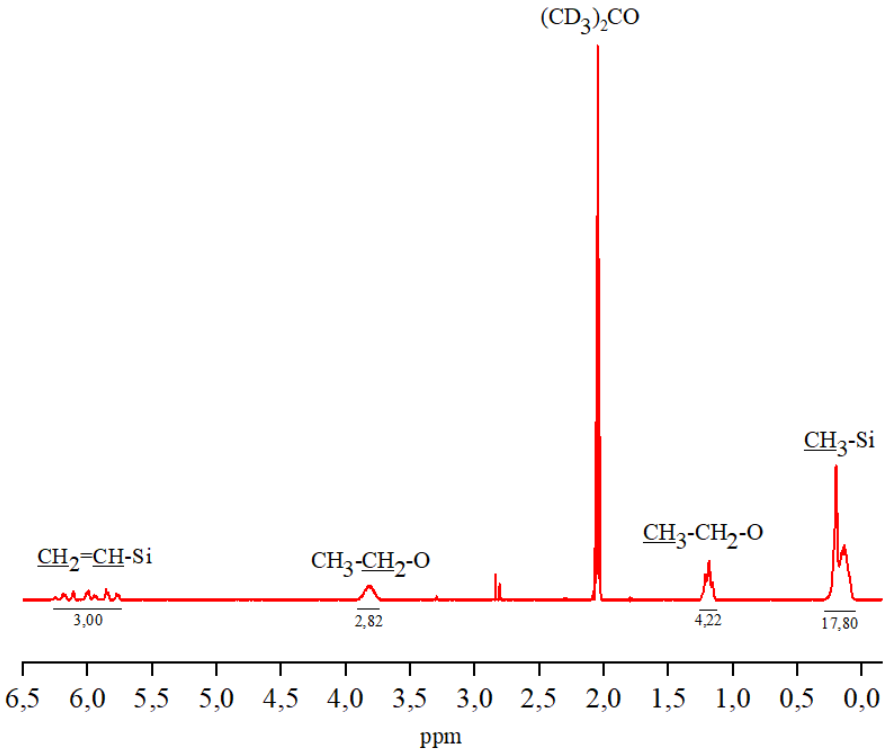


Figure S2. ^{1}H NMR spectrum of the blocked product.