

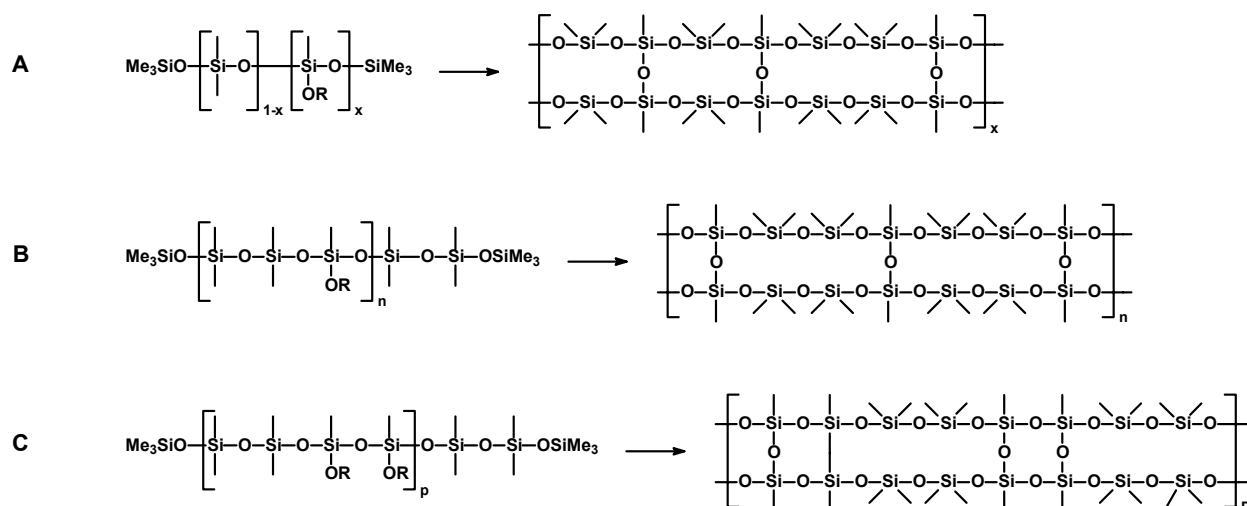
New POSS-Siloxane Materials of Ladder-Like Structure

M. Handke¹, A. Kowalewska²

¹Faculty of Materials Science and Ceramics, AGH University of Science and Technology
Al. Mickiewicza 30, Kraków, POLAND

²Centre of Molecular and Macromolecular Studies, Polish Academy of Sciences
Ul. Sienkiewicza 112, Łódź, POLAND
e-mail: mhandke@agh.edu.pl

A series of POSS-siloxane materials containing ladder-like linkages between siloxane chains was obtained with linear oligosiloxane precursors bearing side alkoxy groups {siloxanes of regular structure A [M(D₂D^{OR})₁₀D₂M] and B [M(D₂D^{OR})₂]₁₀D₂M}, as well as oligomers of random distribution of Si-OR units along the main siloxane chain C [PDMS(1-x)PM(OR)S_x (x = 0.15, 0.3, 0.5, 1.0)]. Alkoxy-functionalized oligosiloxane precursors were cross-linked under hydrolytic condensation conditions. The relationship between the structure of siloxane chain (the amount of Si-OR units and their distribution along the polymer backbone) and the properties of obtained preceramic materials were studied by CP-MAS NMR, DSC, TGA, SEC. The details including analysis of the influence of type-T siloxane linkages distribution on the polymer properties will be described.



Selected POSS-siloxane materials were heated in the temperature range 600 to 1000 °C in both, air and argon atmospheres. The structure of final ceramic materials was determined by FT-IR, CP MAS-NMR and XRD methods.

Acknowledgment

Financial support for this work was provided by Polish Ministry of Science and Higher Education under grant N507 093 31/2271.