

Liquid Crystalline Silicon-containing Oligomers

J.T. Sołtysiak^a, E. Białecka-Florjanczyk^b

a Industrial Chemistry Research Institute, Rydygiera 8, 01-793 Warsaw, Poland
b Warsaw University of Life Science, Institute of Chemistry, Nowoursynowska 166, 02-797 Warsaw, Poland

Side-chain siloxane polymers and oligomers are materials of significant technological interest. The siloxane bond offers a highly flexible structural unit, low transition temperatures and unique physical and chemical properties. Siloxane oligomers have also received great attention recently because they offer the potential to combine the properties of inorganic backbones and the organic mesogenic moieties into a single nano-structured phase, with a high degree of control of the structure-properties relationships. Functionalised polyhedral silsesquioxanes with controlled structure are a class of promising compounds as components of high performance nano-composite materials, and have been used to improve the property of various polymeric systems.

Liquid-crystalline octasilsesquioxanes was synthesized by a platinum-catalyzed hydrosilylation reaction of the octakis(dimethylsiloxy)silsesquioxanes with a modified mesogen. The LC silsesquioxanes were characterised by NMR, FTIR, and TGA. The phase behaviour of oligomers was studied by DSC, polarizing optical microscopy and X-ray diffractometry. Difference in molecular (length of flexible spacer and rigidity of mesogenic unit) has a result in a noticeable shift of phase transition temperatures.

Acknowledgment: this work was supported by grant MNiSz N205 06031/1568