

# HIERARCHICALY POROUS MONOLITHS FROM THIOLS/ALKENES BY COMBINING HARD SPHERE AND EMULSION TEMPLATING

Muzafera Paljevac and Peter Krajnc

University of Maribor, Faculty of Chemistry and Chemical Engineering, PolyOrgLab,  
Smetanova 17, 2000 Maribor, Slovenia, peter.krajnc@um.si

Polymerization of high internal phase emulsion (HIPE) is a technique which results in a highly open cell porous polymers. Usually, the continuous phase of a HIP emulsion contains monomers, while the droplet phase (usually water) is used to form larger pores with diameters between 1 to 100  $\mu\text{m}$ , which are interconnected with smaller pores. Another technique for preparation of open cell porous polymers is hard sphere templating. Within this method, polymer beads are sintered forming a hard sphere template. A monomer mixture is applied into the voids of template and polymerized. After the polymerization of monomeric mixture, the hard sphere template is removed by dissolving in organic solvent and macroporous cellular structure remains. Larger pores of new polymer are formed at position of beads and their diameter corresponds to the diameter of used beads.

Herein, we report the preparation of porous materials by combining both hard sphere and emulsion templating. Poly(methyl methacrylate) PMMA beads with average diameter 110  $\mu\text{m}$  were chosen to form hard sphere template. HIP emulsion, based on pentaerythritol tetrakis(3-mercaptopropionate) (TT) and divinyl adipate (DVA), was introduced into the voids of PMMA template and fotopolymerized. The morphology of so prepared material is evident from SEM image (Figure 1).

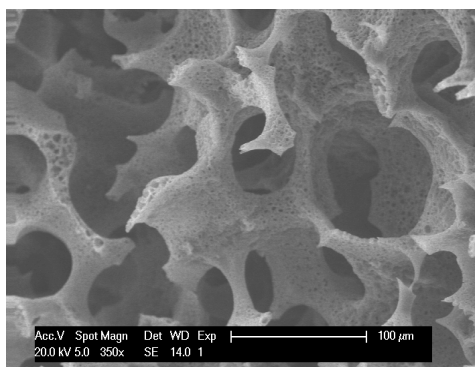


Figure 1: SEM image of poly(TT-co-DVA) monolith.

Acknowledgements: Lucite International is gratefully acknowledged for the donation of PMMA beads.