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**Separation of PS-PMMA block copolymers from PS precursors via selective adsorption on nanoporous silica** CHANG YEOL RYU, JUNWON HAN, Department of Chemistry and Chemical Biology, Rensselaer Polytechnic Institute, Troy, NY 12180 — We report a simple adsorption-based separation method using nanoporous silica in solution via controlling solvent quality to remove polystyrene (PS) homopolymers from polystyrene-poly(methyl methacrylate) (PS-PMMA) diblock copolymers. In particular, the solvent quality is controlled by employing binary mixed solvents of THF (good solvent) and isooctane (nonsolvent for both PS and PMMA). The aim of this work is to qualitatively study the competitive adsorption between PS and PS-PMMA and to provide a correlative understanding of polymer adsorption in nanopores with interaction chromatography techniques. In addition, the quantitative understanding of polymer adsorption is further employed to develop a simple polymer separation scheme for manipulating polymer adsorption via solvent quality. In particular, concentration changes of PS and PS-PMMA in the supernatant solution have been quantitatively measured for the adsorption studies using solvent gradient interaction chromatography techniques. We found that the PS-PMMA (43k-32k) selectively adsorb over PS (43k) precursors at the THF composition window between 42 % and 55% in THF/IO (v/v) mixed solvents. For THF/IO solvents with composition higher than 60 % THF, polymers did not adsorb to the nanoporous silica due to the good solvent quality.

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