

## Departmental Seminar Announcement

### Large-scale separation and purification of block copolymers via selective and competitive adsorption on silica

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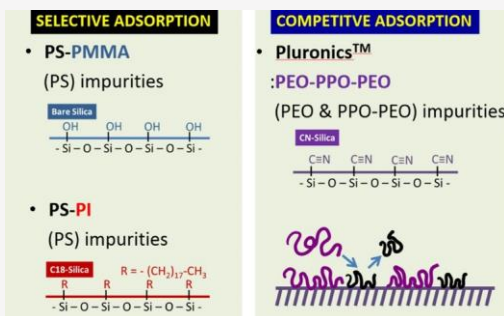
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As a new variant of polymer liquid chromatography techniques, the adsorption-based interaction chromatography can be ideally suited for the analysis of chemical heterogeneity in block copolymers, because the polymer adsorption conditions in solution are dependent on the chemical nature of polymer chains. Furthermore, the knowledge of block copolymer adsorption from the interaction chromatography can be transferred to develop a large-scale purification method of block copolymers by manipulating the adsorption of homopolymers and block copolymers on to silica in solution. Here, we have demonstrated two examples of block

copolymer purification in large scale (**Figure 1**). The first case utilized the selective adsorption of block copolymers on silica by tuning the solvent quality. Specifically, we have demonstrated how the polystyrene-*b*-poly(methyl methacrylate) (PS-PMMA) diblock copolymers synthesized by anionic polymerization can be purified using a simple silica gel gravity column to obtain homopolymer-free PS-PMMA block copolymers in a large scale.

The second case was developed based on the competitive adsorption of block copolymers on silica surface in solution. Specifically, we will demonstrate how one can purify Poly(ethylene oxide)-*b*-poly(propylene oxide)-*b*-poly(ethylene oxide), PEO-PPO-PEO, Pluronic block copolymers by taking advantages of competitive adsorption of block copolymers in solution using beakers and simple filtration systems. Finally, the impacts of the block copolymer purification on the self-assembly and properties of block copolymers will be highlighted to emphasize the utility of the large scale purification methods in the study of block copolymer materials.



**Figure 1.** Schematic diagram to show the block copolymer purification by selective adsorption and competitive adsorption on silica surface.

Date: Friday, February 10, 2017

Time: 11:00 am to 12:00 pm

Location: PG5 -153 MMC (Live)

Marine Sciences Building Room 105 (MSB-105) – BBC (via Polycom)