Thermo-responsive Polymer Brush Surfaces with Hydrophobic Groups for All-Aqueous Chromatography

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EXPERIMENTAL SECTION

Retrieving and Analyzing of Grafted Copolymer

Copolymer grafted silica bead surfaces were treated with concentrated hydrofluoric acid for 3 h, and the solution was neutralized with sodium carbonate. The solution was filtered and dialyzed against Milli-Q water using a dialysis membrane [Spectra/Por standard regenerated cellulose dialysis membrane, Molecular Weight Cut Off (MWCO): 1000] (Spectrum Laboratories, Rancho Dominguez, CA, USA) for 5 days with daily water changed, and the copolymer was recovered by freeze-drying. Number-average molecular weights and PDI values of the polymer were determined using a GPC system HLC-8320GPC (the columns: TSKgel G3000H and TSKgel G4000H) (Tosoh, Tokyo, Japan). A calibration curve was obtained using poly(ethylene glycol) standards. The flow rate was 1.0 mL/min. The mobile phase was *N,N*-dimethylformamide (DMF) containing 50 mmol/L LiCl, and the column temperature was controlled to be 45 °C using a column oven, and the elution profiles were monitored by a refractometer.

Figure S.1 GPC of the copolymer for obtaining the molecular weight: (A) IPB-0B, (B) IPB-1B, (C) IPB-3B, and (D) IPB-5B (Table 3). Mobile phase is DMF containing 50 mmol/L LiCl.

Figure S.2 Chromatograms of dexamethazone on HPLC of which packing materials was poly(*N*-isopropylacrylamide-*co*-butyl methacrylate) grafted silica beads at various temperatures: (A) IPB-1B, and (B) IPB-3B columns (Table 3). The mobile phase is Milli-Q water. Dexamethazone was monitored at 254 nm by UV detection with a flow rate 1.0 ml/min.

Figure S.3 Chromatograms of ethyl *p*-aminobenzoate on IPB-3B column at various temperatures: (A) using 16.7 mmol/L phosphate buffer (pH 2.5), and (B) using 16.7 mmol/L phosphate buffer (pH 7.0). Ethyl *p*-aminobenzoate was monitored at 254 nm by UV detection with a flow rate 1.0 ml/min.