† Electronic Supplementary Information (ESI) available:

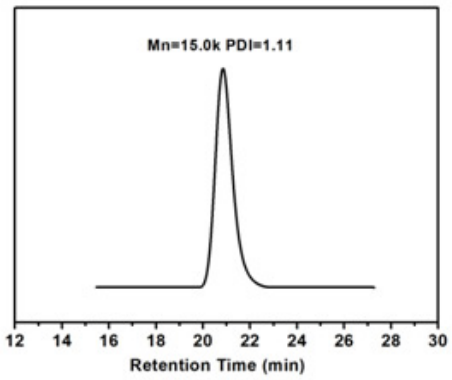

Figure S1. GPC trace of fluorescein-labeled poly(methyl methacrylate) (f-PMMA).

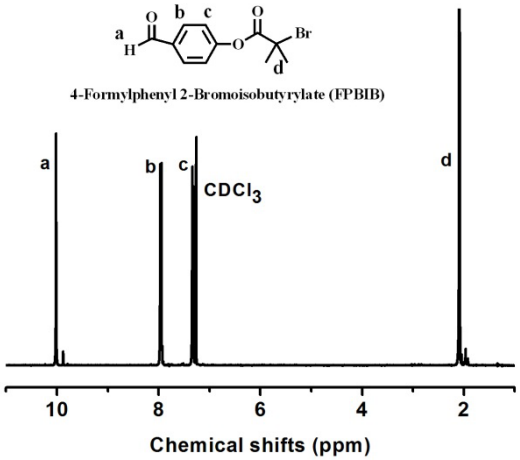

Figure S2. Chemical structure and ^{1}H NMR spectrum of 4-formylphenyl 2-bromoisobutyrylate (FPBIB) in $CDCl_3$.

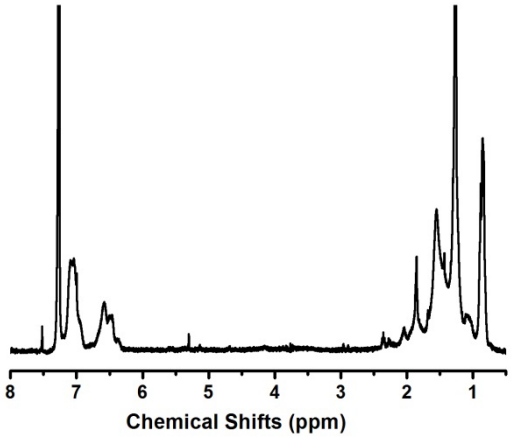

Figure S3. ^{1}H NMR spectrum of cleaved PS from PS-coated silica particles.

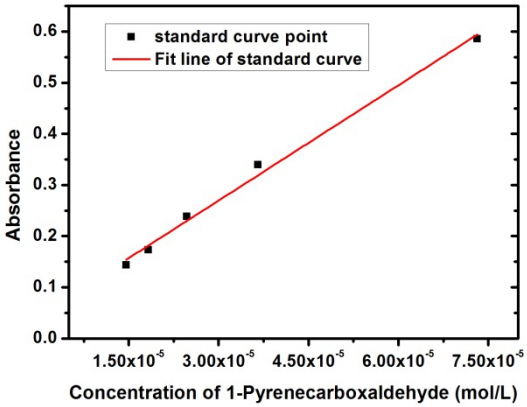

Figure S4. The standard curve of UV-vis absorbance vs. the concentration of 1-pyrenecarboxaldehyde in THF.

Characterization

^{1}H NMR spectra were recorded on a Varian 400 spectrometer. All the samples were measured in deuterated chloroform. The apparent molecular weight and molecular weight distributions of the polymers were determined with a gel permeation chromatograph (GPC) equipped with Hitachi L-2130 HPLC pump, Hitachi L-2350 column oven operated at 40 ^{o}C, three Varian PL columns with 1000K-100K (10E5Å), 100K-10K (10E4Å), and 100-10K (10E3Å) molecular ranges, and a Hitachi L-2490 refractive index detector. THF was used as eluent at a flow rate of 1.0 mL/min. Molecular weights were calibrated on PS standards. The thermal properties of the particles were measured by thermogravimetric analysis (TGA). The samples were heated to 800 ^{o}C at a heating rate of 10 K/min under a nitrogen atmosphere on a Netzsch TG 209. High-resolution transmission electron microscope (TEM) observations were carried out on a Tecnai G2 20S-TWIN electron microscope equipped with a model 794 CCD camera (512 x 512). TEM specimens were prepared by dipping copper grids into dispersions of silica particles and drying in air. Dynamic light scattering (DLS) measurements were conducted on a Zetasizer Nano ZS from Malvern Instruments equipped with a 10 mW HeNe laser at a wavelength of 633 nm. The results were analyzed in CONTIN mode. UV-visible absorption spectra were collected on a Shimadzu UV-2450 spectrometer. Steady state fluorescence spectrum of fluorescence-labeled silica particles were recorded on a Shimadzu RF-5301PC fluorescence spectrophotometer. The excitation slit was set at 1.5 nm, and emission slit was set at 3 nm. The excitation wavelength of the emission spectra was set at 343 nm.