Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

Molecular Design of the Amphiphilic AB Diblock Copolymer toward One-Step Synthesis of Amino-group Functionalized large Pore Mesoporous Silica

Dongpo Xu, Yuan Yao*, Lu Han, and Shunai Che*

SI1. Gel permeation chromatograms of the polymers

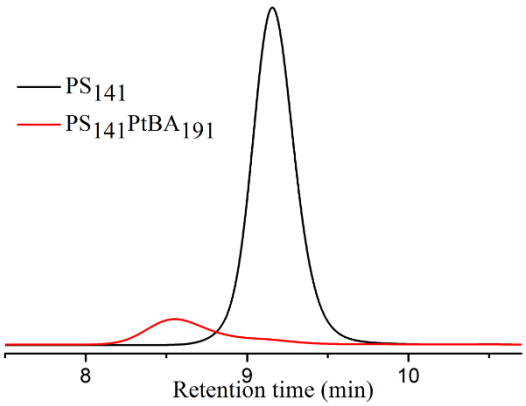

Figure S1. Gel permeation chromatograms of the polymers.

SI2. ^{1}H NMR and 13C NMR spectra of the polymers.

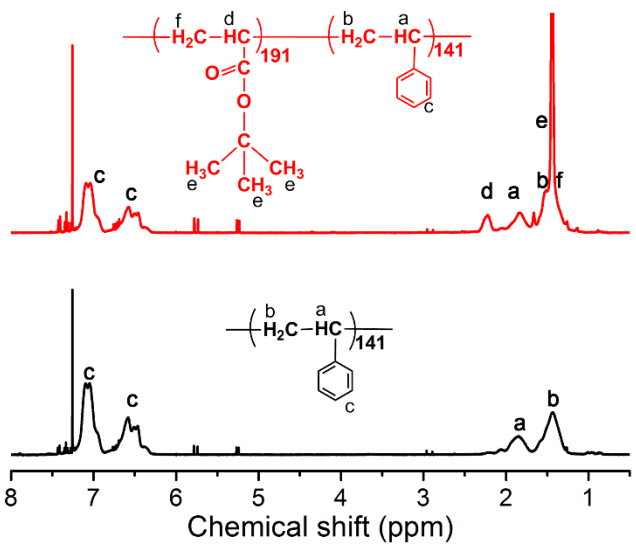

Figure S2. ^{1}H NMR spectra of the polymers.

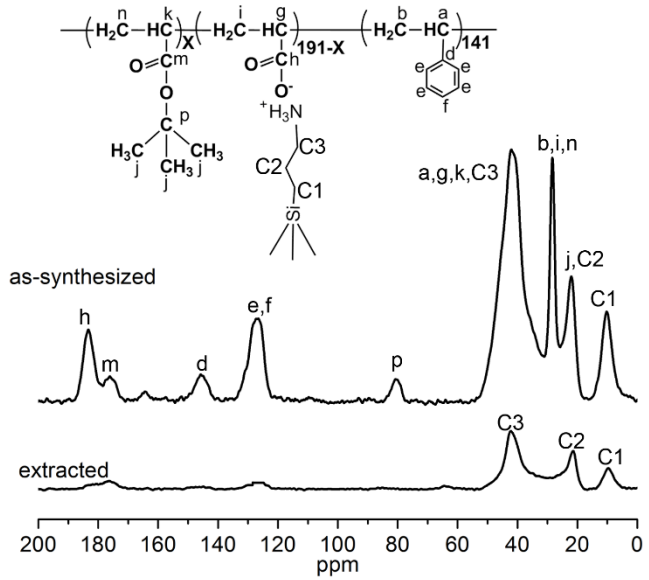

Figure S3. Solid ^{13}C NMR images of the as-synthesized and extracted samples synthesized by PS_{141} PAA_{191}.

The chemical shift of the carboxyl groups (m) of PAA and carbonyl (h) of ester are at 183.3 ppm and 175.7 ppm. The benzene ring carbon (d) which connect with the main chain is at 146.0 ppm, and the other carbons (e and f) of the benzene ring are at 126.3 ppm. The tertiary carbon (p) is at 79.9 ppm. The carbons (a) connect with benzene ring, carbons (g and k) connect with carboxyl groups, and carbons (C3) connect with amino group of the CSDA are at 42.4 ppm. The methylene carbons of the main chain of PS (b) and PAA (i and n) are at 28.2 ppm. The carbon of methyl (j) connect with tertiary carbon and carbon (C2) of CSDA are at 22.2 ppm. The carbon (C1) connect with silicon of CSDA is at 10.3 ppm. The NMR spectrum of the extracted silica shows three resonance signals at 9.6, 21.3 and 42.3 ppm that could be assigned to carbons (C1, C2 and C3) of the CSDA, respectively.

SI3. The Calculation of Theoretical Surface Area

Cell parameter a=49.7 nm

$d_{channnel}$=27.5 nm

ρ_{SiO2}=2.2g/cm^3

The length of channels in 1 gram SiO_2= l ,

Volume of 1 gram SiO_2=V_{si}

$V_{si}=3\sqrt{3}a^2\ l/2-3\pi(d/2)^2 l=1/2.2*10^{-6}$

$l=9.8054*10^7$ m

$S=3\pi dl=25.41\ m^2$