

Effective method for removal of polymeric template from SBA-16 silica combining extraction and temperature-controlled calcination

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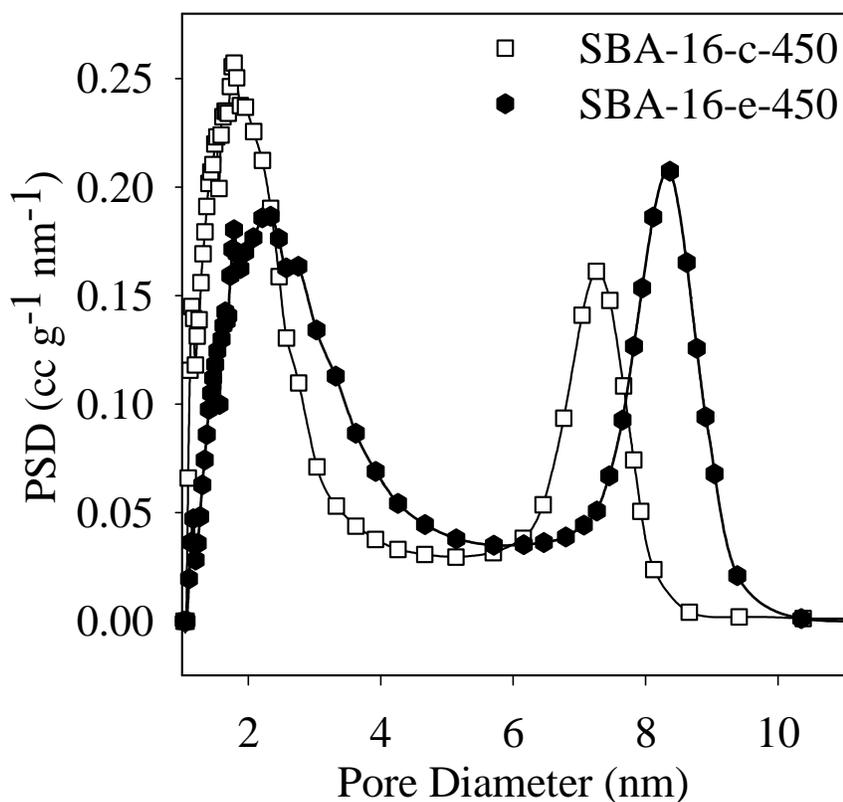


Figure 1S.

Comparison of pore size distributions (PSDs) calculated by the KJS method (Kruk et al., *Langmuir* 13, 1997, 6267) from nitrogen adsorption isotherms for the SBA-16 samples calcined and extracted-calcined at 450 °C.

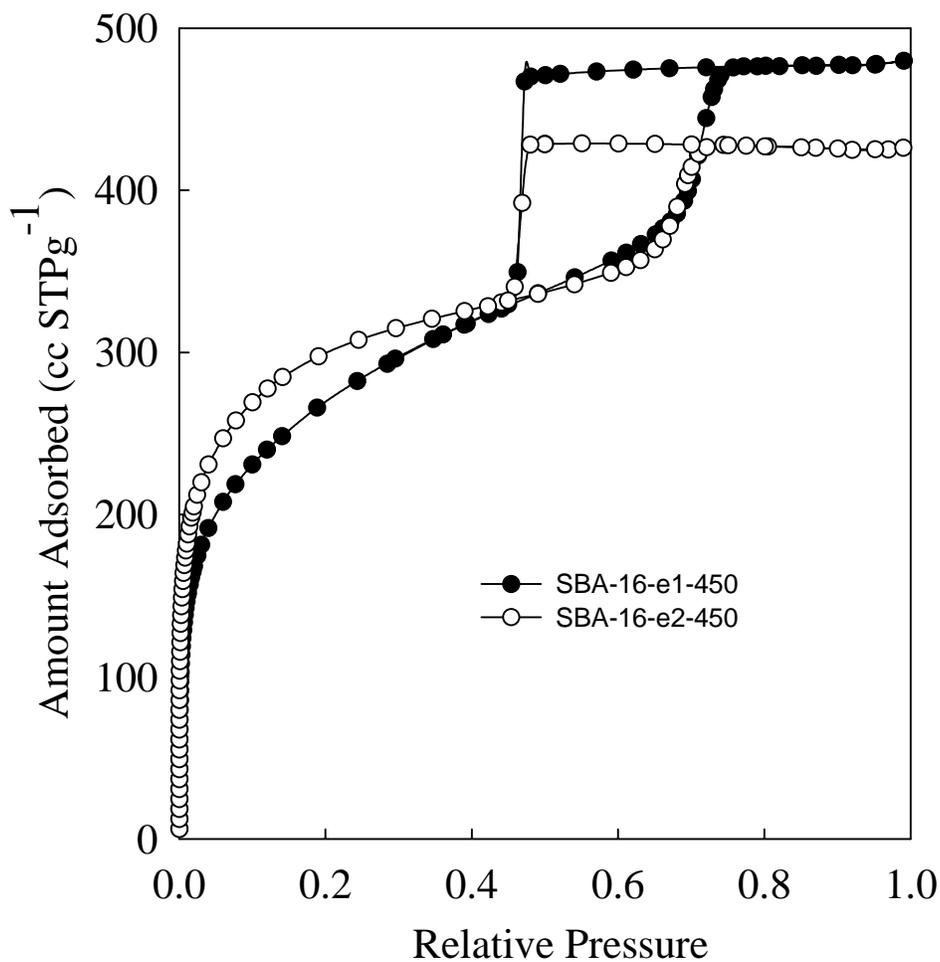


Figure 2S.

Comparison of nitrogen adsorption-desorption isotherms measured at $-196\text{ }^{\circ}\text{C}$ for the SBA-16 samples denoted as SBA-16-ex-450, where ex and 450°C indicate extraction resulted in removing different amount of polymeric template (see Table 1S) and temperature of calcination, respectively.

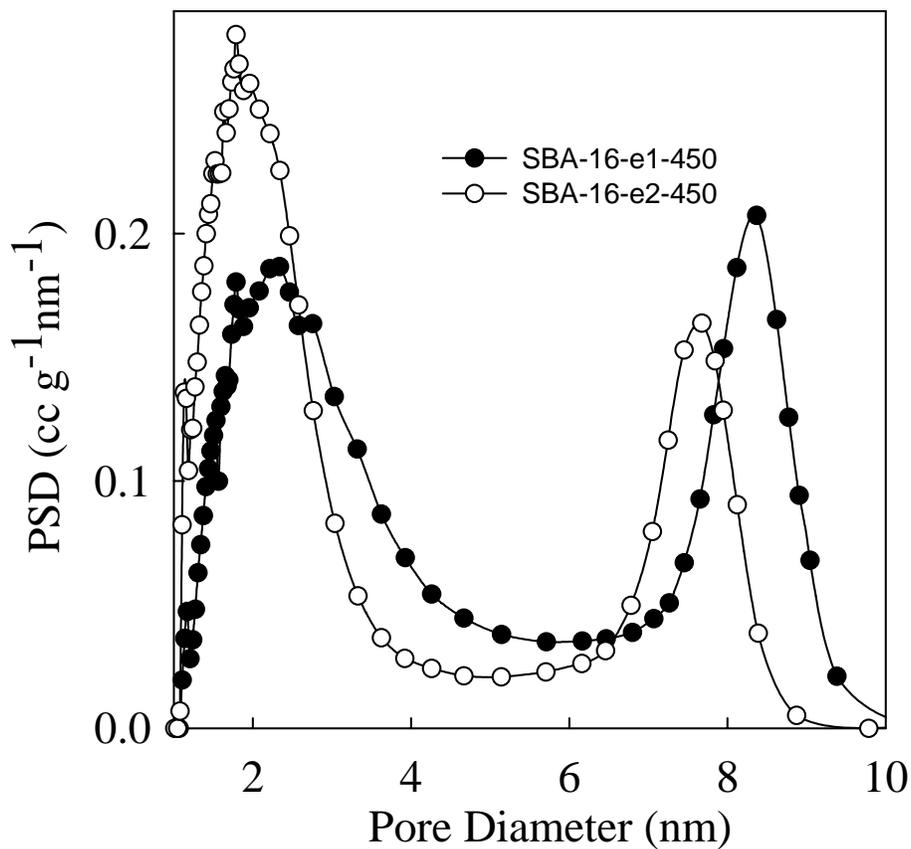


Figure 3S.

Pore size distributions (PSDs) calculated by the KJS method (Kruk et al., *Langmuir* 13, 1997, 6267) from nitrogen adsorption isotherms for the SBA-16 samples denoted as SBA-16-ex-450, where ex and 450°C indicate extraction resulted in removing different amount of polymeric template (see Table 1S) and temperature of calcination, respectively.

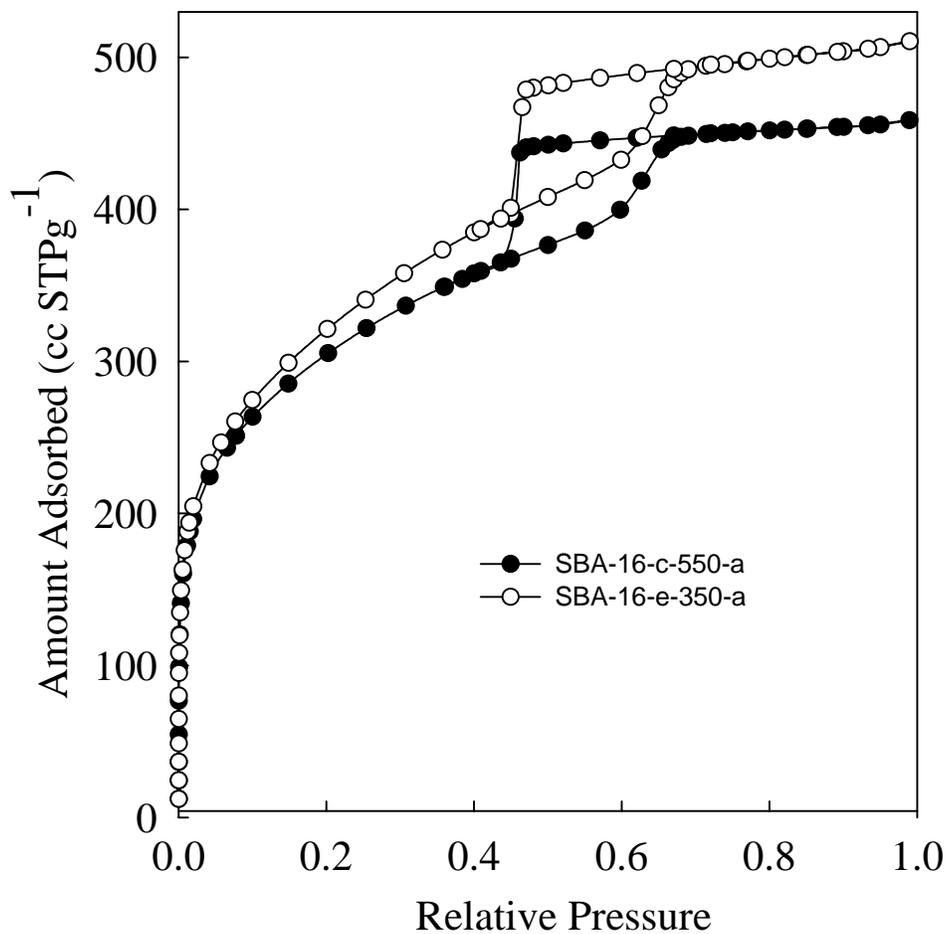


Figure 4S.

Comparison of nitrogen adsorption-desorption isotherms measured at $-196\text{ }^{\circ}\text{C}$ for the SBA-16 samples denoted as SBA-16-x-y-a, where x denotes either extraction (e) or calcination (c), y denotes temperature of calcination and a refers to the synthesis recipe reported by Ryoo et al. (*J. Phys. Chem. B* 108, 2004, 11480).

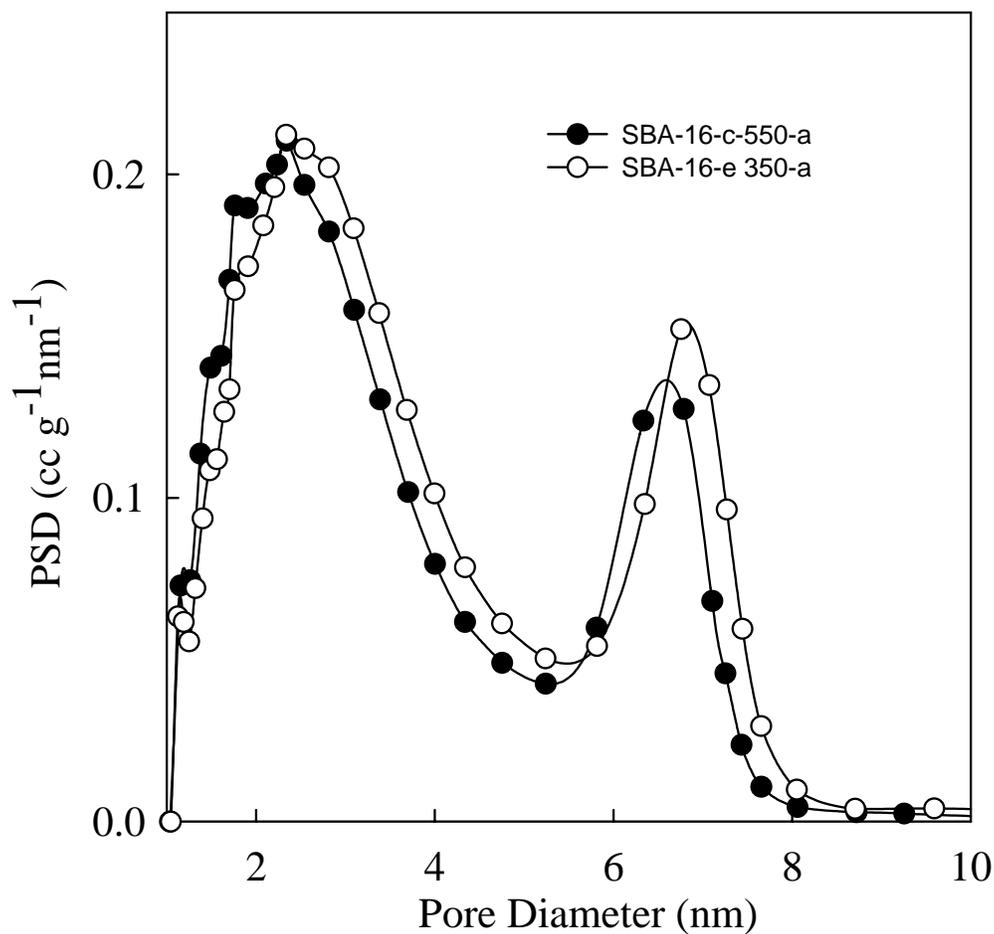


Figure 5S.

Pore size distributions (PSDs) calculated by the KJS method (Kruk et al., *Langmuir* 13, 1997, 6267) from nitrogen adsorption isotherms for the SBA-16 samples denoted as SBA-16-x-y-a, where x denotes either extraction (e) or calcination (c), y denotes temperature of calcination and a refers to the synthesis recipe reported by Ryoo et al. (*J. Phys. Chem. B* 108, 2004, 11480).

Table 1S.

Structural properties determined from XRD, elemental analysis and nitrogen adsorption data for as-synthesized SBA-16 samples extracted to remove different amounts of the template (e1 and e2) and calcined at 450 °C.

Sample	S_{BET} (m²g⁻¹)	V_t (cc g⁻¹)	V_p (cc g⁻¹)	w_{KJS} (nm)	% C
SBA-16-e1-450	980	0.75	0.38	8.34	0.15
SBA-16-e2-450	1101	0.67	0.23	7.68	0.71
SBA-16-extracted 1	941	0.60	0.23	7.02	5.13
SBA-16-extracted 2	-	-	-	-	11.91
SBA-16-composite	-	-	-	-	19.64

Notation: S_{BET}, BET specific surface area; V_t, total pore volume; V_p, volume of primary mesopores; w_{KJS}, diameter of mesopore cages estimated using the KJS method developed for cylindrical mesopores (the actual diameter of spherical pores of SBA-16 is likely to be about 2 nm higher than the values provided); % C, carbon percentage; a, unit cell parameter; -, parameters not determined.