Supplementary Information

Figure S1: ^{29}Si MAS-NMR spectra of silicalite-1 samples SA1 and SA4 synthesized at 90 °C for a duration time of 24 h and a H_2O/SiO_2 ratio of (a) 20.8 and (b) 251.7 using Sigma-Aldrich TPAOH.

Figure S2: (a) Specific surface area S_{BET} and (b) micropore volume (t-plot method) of the silicalite-1 particles as a function of the water/silica ratio.

Figure S3: Size distribution by intensity of scattered light, obtained by using DLS, represented for the silicalite-1 samples SA1, SA4 and SA5 synthesized at 90 °C for a duration time of 24 h and a H_2O/SiO_2 ratio of (a) 20.8, (b) 251.7 and (c) 519.3.

Figure S4: Size distribution by intensity of scattered light, obtained by using DLS, represented for the silicalite-1 samples AA1, AA2 and AA4 synthesized at 90 °C with a H_2O/SiO_2 ratio of 50 and a duration time of (a) 17.9, (b) 24 and (c) 48 h.

Figure S5: High-resolution TEM pictures of silicalite-1 samples SA1 and SA4 synthesized at 90 °C with a duration time of 24 h and a H_2O/SiO_2 ratio of (top) 20.8 and (bottom) 251.7. Samples were synthesized using Sigma-Aldrich TPAOH.

Figure S6: ^{1}H NMR spectra of sulfonated polyetheretherketone (SPEEK) polymers with a sulfonation degree of (a) 69.4 and (b) 85.0 %.

Figure S7: Representative pictures of silicalite-1/SPEEK nanocomposite membranes prepared with (a) 2.24 wt% and 85%, (b) 7.30 wt% and 69.4% and (c) 14.89 wt% and 69.4% for the zeolite particles content and the polymer DS, respectively (Sample AA2, particles size 155 ± 50 nm).

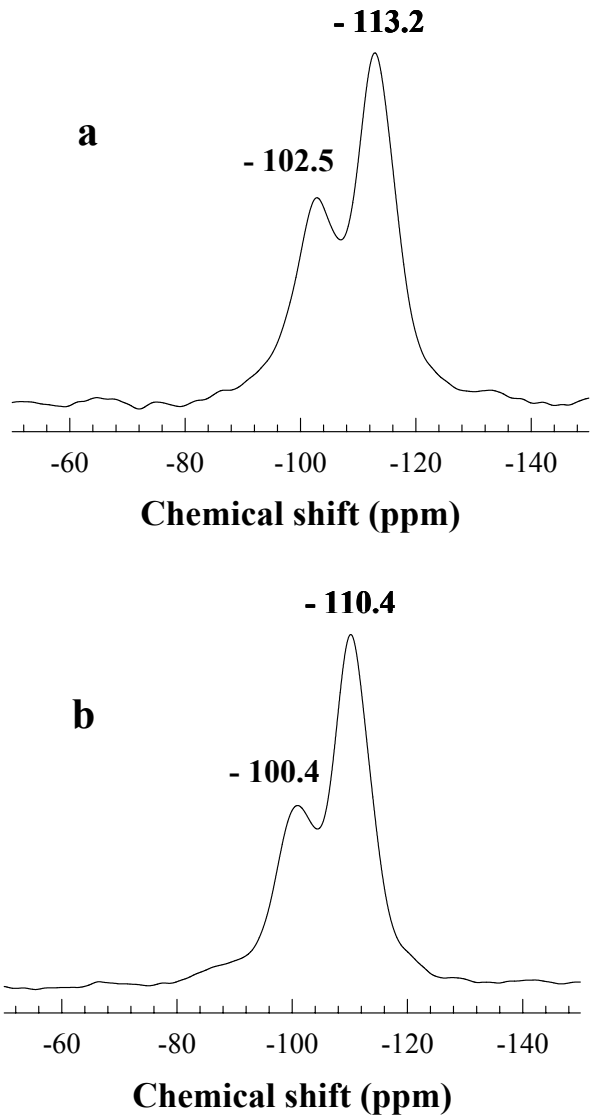

Figure S1

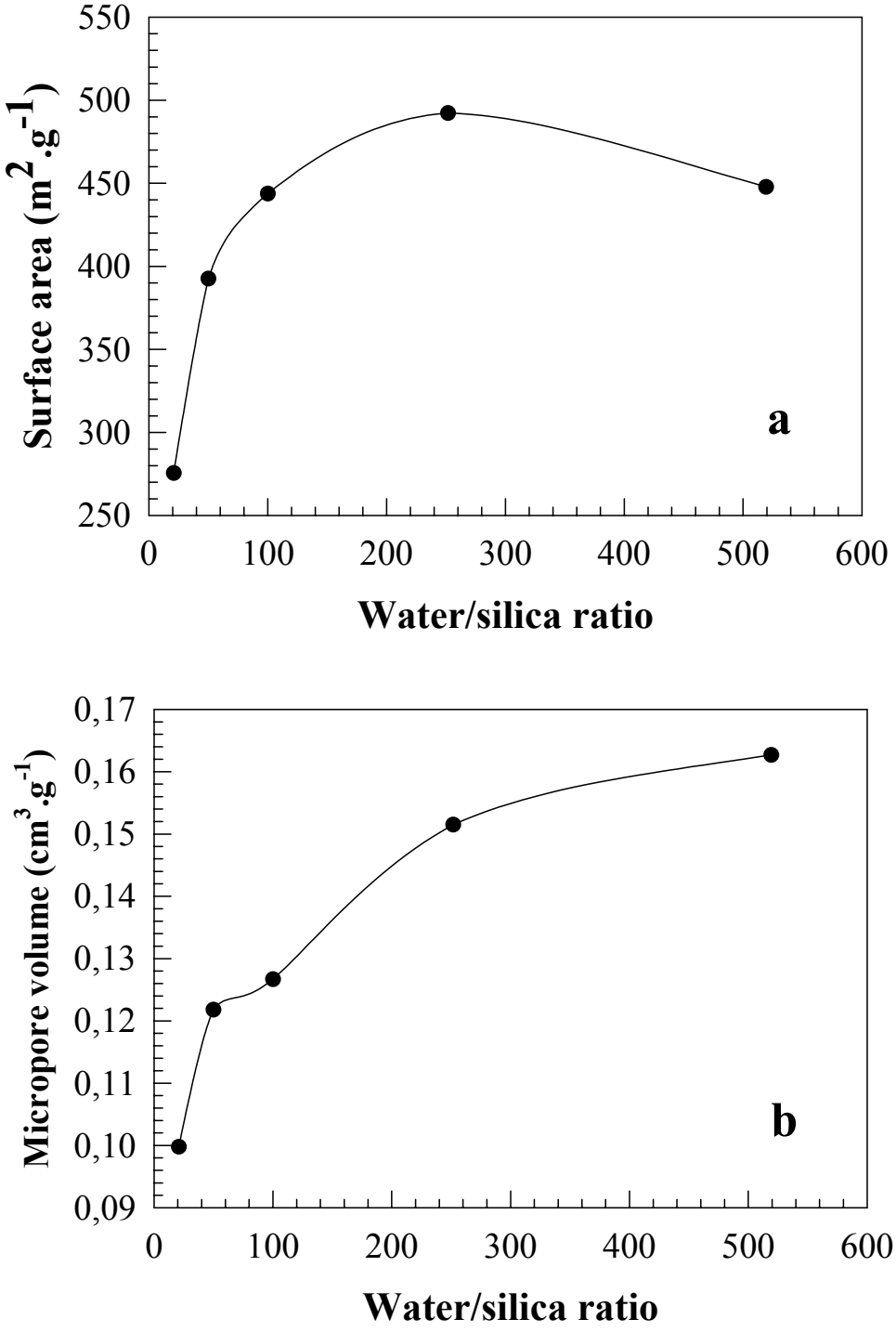

Figure S2

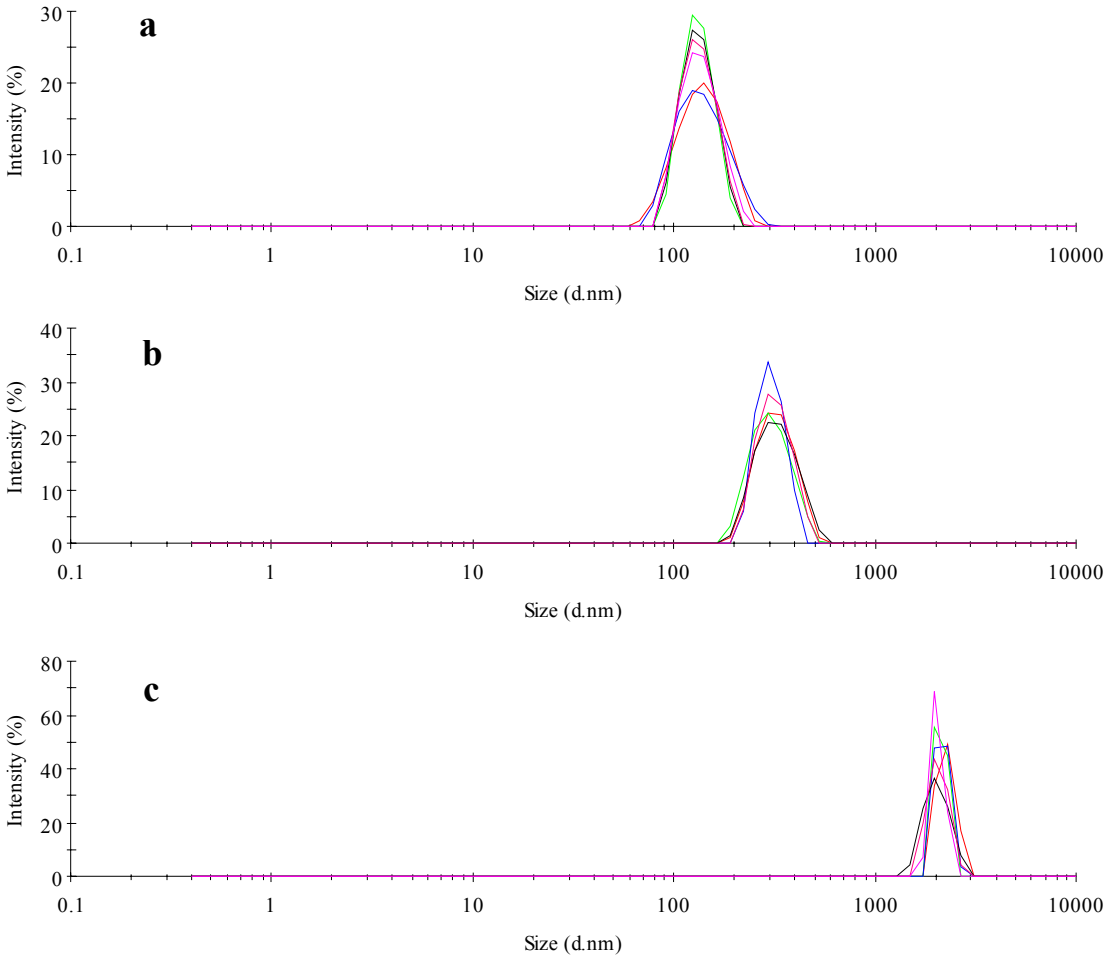

Figure S3

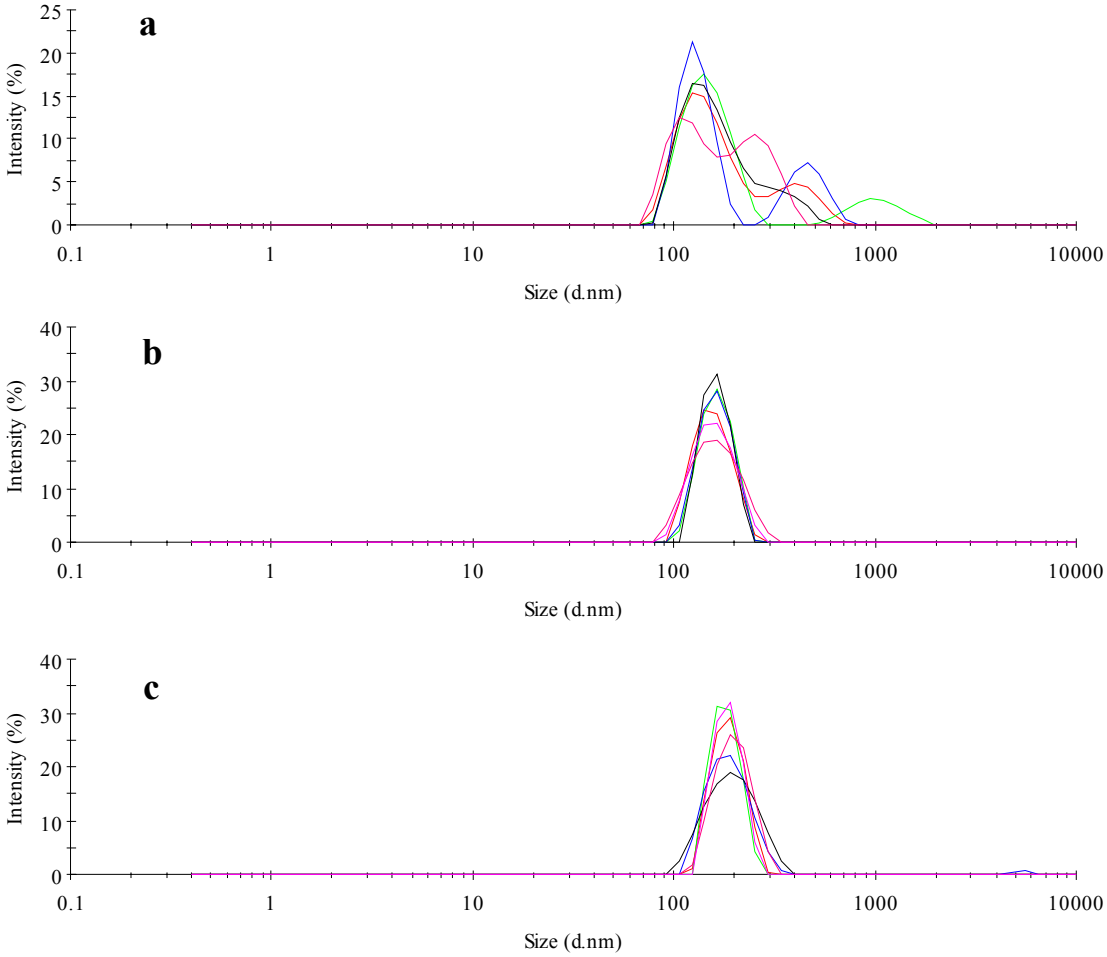

Figure S4

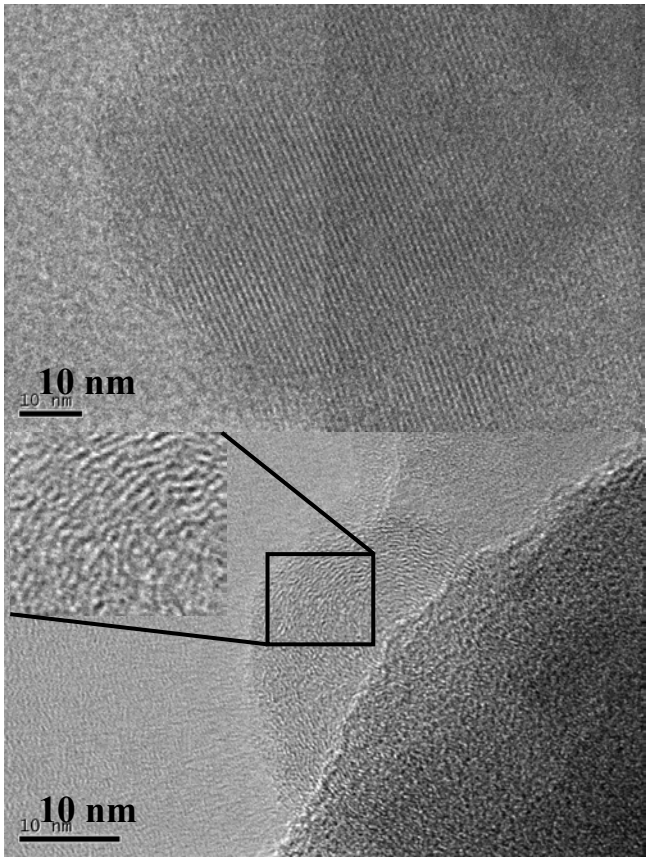

Figure S5

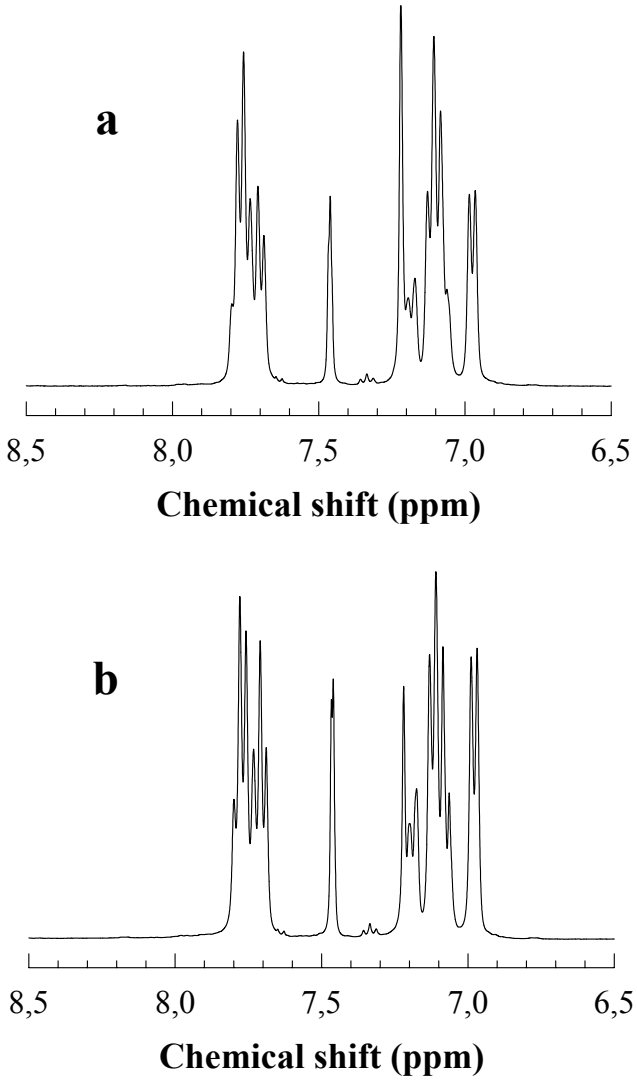

Figure S6

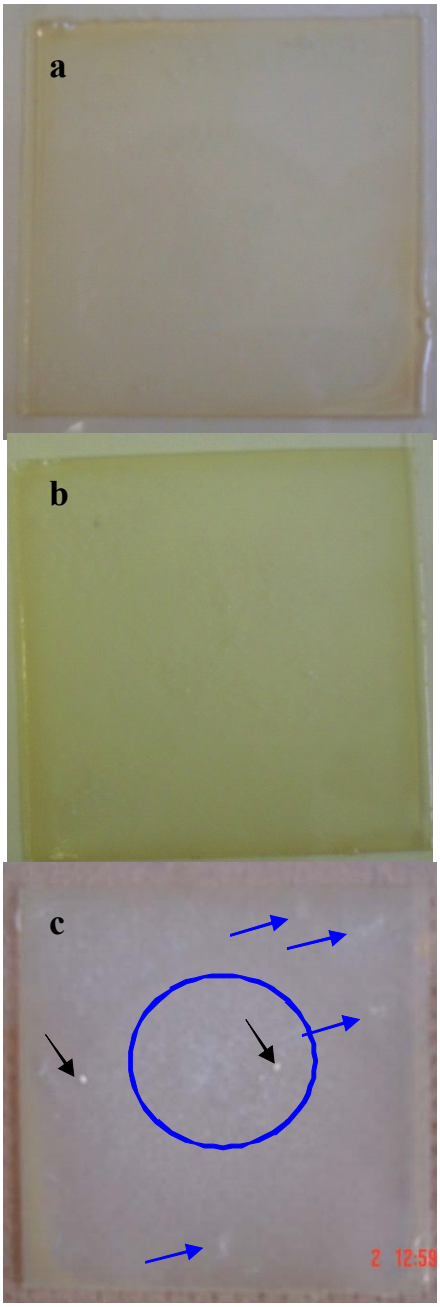

Figure S7