Supporting Information for

From micelle supramolecular assemblies in selective solvents to isoporous membranes

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Table 1. Dielectric constants (ε) and solubility parameter contributions (δ) for different solvents and copolymer segments

	ε[1]	δ [MPa]$^{1/2}$ [2]			
		δ_D	δ_P	δ_H	$\delta = (\delta^2_D + \delta^2_P + \delta^2_H)^{1/2}$
Styrene	2.6	18.6	1.0	4.1	19.1
Pyridine	12.3	19.0	8.8	5.9	21.8
THF	7.6	16.8	5.7	8.0	19.5
DMF	36.1	17.4	13.7	11.3	24.9
Water	81.0	15.5	16.0	42.3	47.8
1,4-Dioxane	2.25	19.0	1.8	7.4	20.5

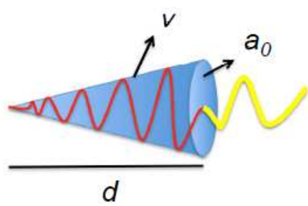

Figure S1. Schematic of cylindrical micelle structure with variables for the packing parameter p (v = volume and d = length of the solvent-phobic block; a_0 is the optimal surface area of the solvent-phobic block at the blocks interface).[2]

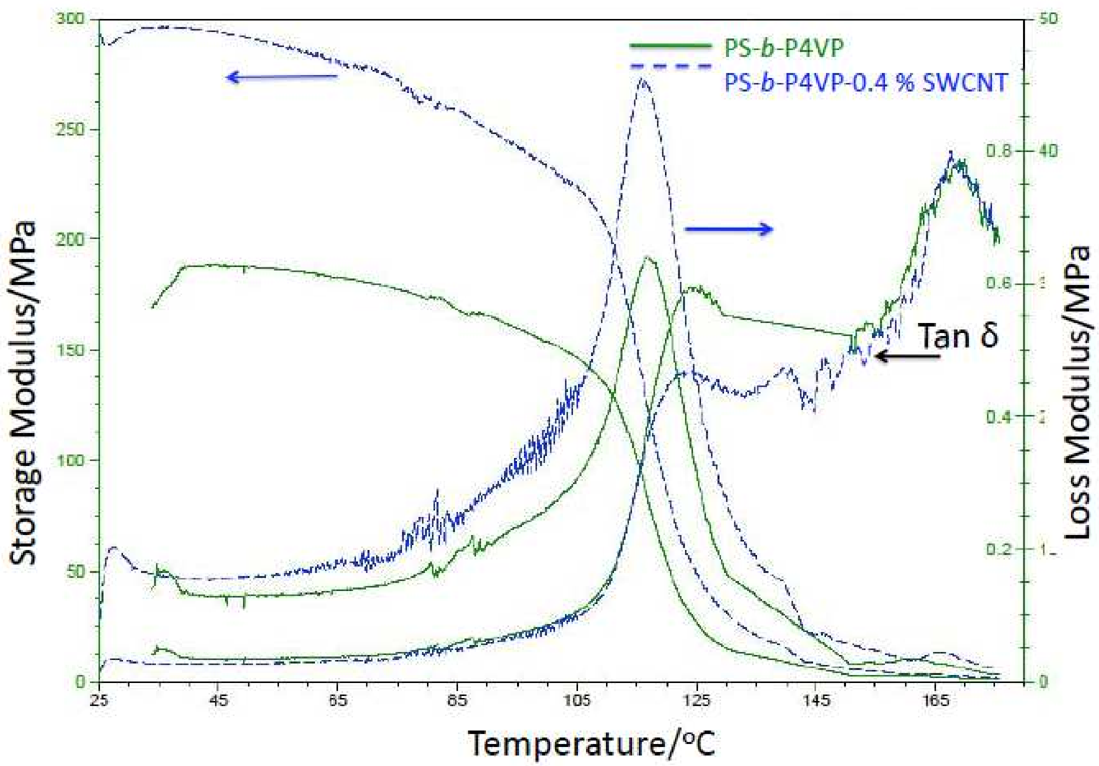

Figure S2. Dynamic mechanical analysis of a membrane sample with (blue) and without (green) carbon nanotubes

Experimental conditions: temperature: 25 to 180 C, ramp rate 5 C/min, frequency 1.0 Hertz, sample dimension: length x width x thickness : 21 mm x 0.53mm x 0.10 mm

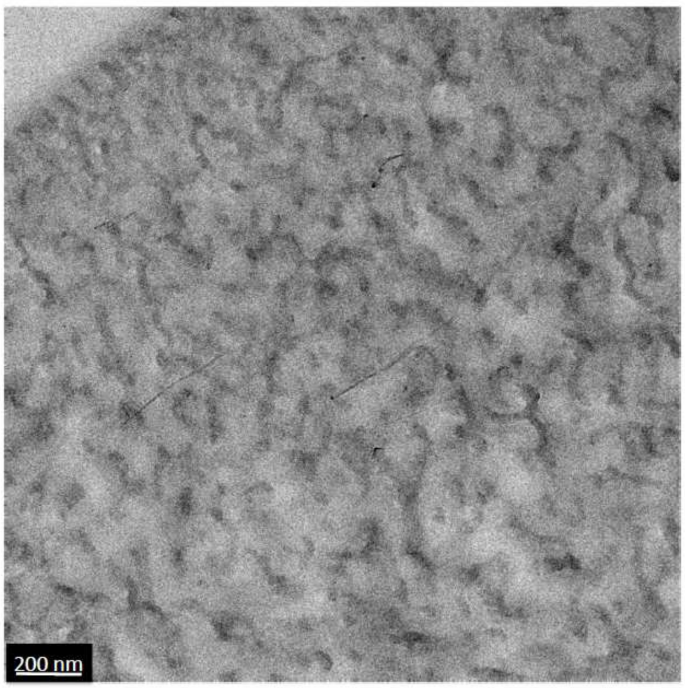

Figure S3. Transmission electron microscopy of membrane cross-section containing carbon nanotubes

Comparison between conventional asymmetric membranes and block copolymer membranes:

Asymmetric polyethersulfone membranes, as well as analogous membranes made of cellulose acetate, polyacrylonitrile and polyvinylfluoride, are commercially available for decades. A detailed description of characteristics of these membranes is published by Nunes and Peinemann[4]. A typical surface image of a conventional polyetherimide membrane, similar also to conventional polyethersulfone membranes, can be seen in the scanning electron microscopy shown in Figure S4. The block copolymer membrane prepared according to the approach described in this paper has a much sharper pore size distribution, as can be seen in Figure S5. The broad pore size distribution of currently commercial asymmetric is a considerable drawback as far as selectivity is concerned.

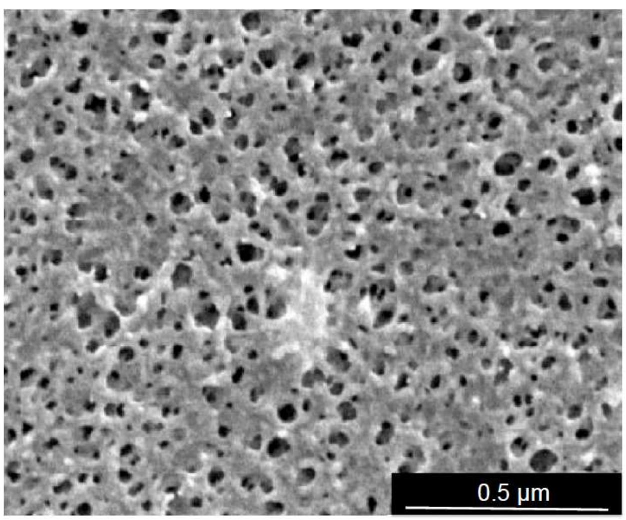

Figure S4. Conventional polyetherimide membrane[4]

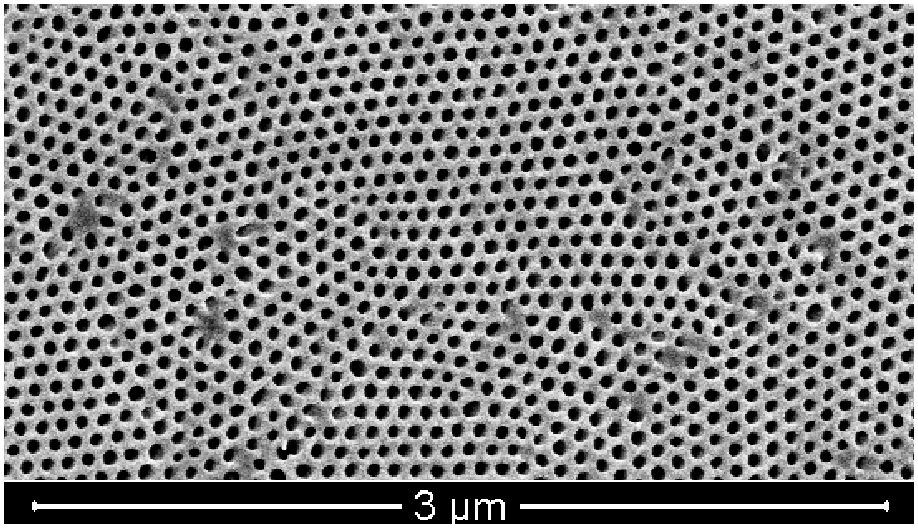

Figure S5. Membrane prepared with PS-b-P4VP copolymers

(1) Huheey, J. E. *Inorganic Chemystry*, Harper and Row: London, 1975.

(2) Hansen, C. M. *Hansen Solubility Parameters: a User's Handbook*, CRC Press: Boca Raton, 2000.

(3) Israelachvili, J. N., *Intermolecular & Surface Forces*. 9th ed.; Elsevier Science Imprint: London, 2002, pp. 450.

(4) Nunes, S. P. and Peinemann, K.-V., editors, *Membrane Technology in the Chemical Industry*, 2nd edition, Wiley, Weinheim, 2006, Part 1.