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Supplementary Materials for Mesoporous Titanium Dioxide Films Using Partially Fluorinated Surfactant Templates in Ethanol

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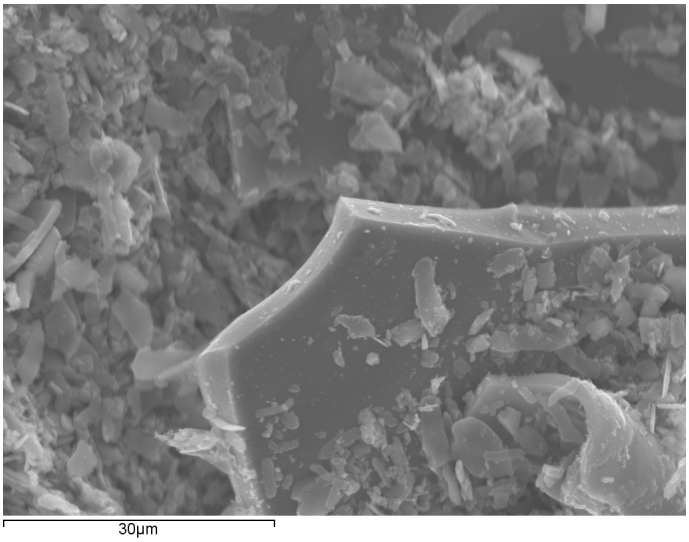
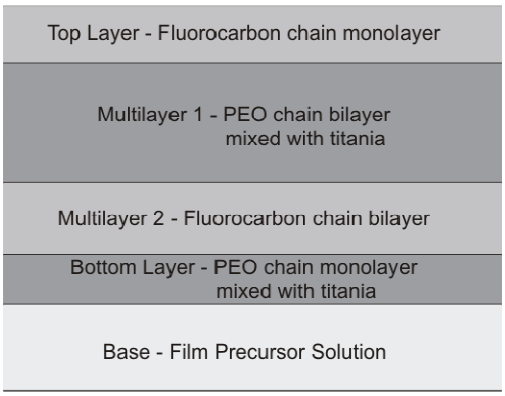
Figure 1S: SEM image of calcined film from the standard preparation after scraping off the microscope slide and grinding, showing the thickness of the film.



Fitting of X-ray and Neutron Reflectivity Patterns from Growing Films

Data was modelled using the Motofit program as a mutilayer lamellar phase as detailed in Figure 1S. To calculate the composition from the scattering length densities, two films grown at the same concentration and at similar points in their growth were chosen. These are not the most ordered films but are typical of developing films under these conditions.

(a)



(b)

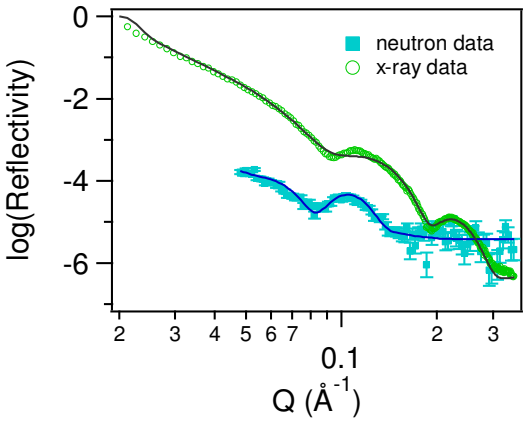
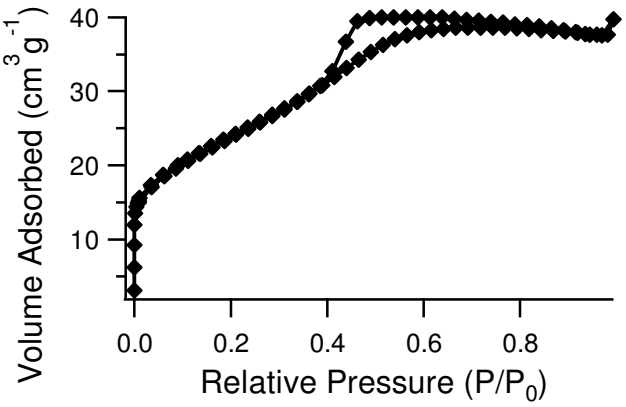


Figure 2S: *(a) Diagram of layered reflectivity models. The number of repeats of the multilayer was adjusted manually while variables within each layer, e.g. layer thickness, were fitted by computer. (b) fitted reflectivity profiles for films grown from standard preparations at approximately the same time point to obtain scattering length densities, used to calculate film composition: X-rays: after 60min (green circles) and neutrons: after 70min (blue squares).*

Table 1S: Details of the modeling of reflectivity profiles for films shown in Figure 2S after film formation was complete (2hrs). Layers Top, Multi 1, Multi 2 and Bottom refer to the layers of the model as in Figure 1S. The scattering length density (SLD) for the fluorocarbon chain region was calculated for perfluorooctane and set to this value during fitting.

Data Set	Multilayer Repeats	Layer	Thickness (Å) ± 2 Å	SLD (x10^{-6} Å^{-2}) ± 0.5 Å^{-2}	Roughness (Å) ± 1 Å
X-ray, ~90min after pouring	1	Top	10	11.1 (fixed)	5
		Multi 1	27	19.6	8
		Multi 2	15	11.1 (fixed)	5
		Bottom	15	19	5
		Subphase	-	9.6	7
Neutron, 70min after pouring	2	Top	10	3.6 (fixed)	7
		Multi 1	31	1.9	8
		Multi 2	32	3.6 (fixed)	8
		Bottom	33	2.7	7
		Subphase	-	3.05 (fixed)	7

Figure 3S: N_2 adsorption and desorption isotherm for calcined FSO-100 templated film material.



This isotherm was used to calculate the BET surface area using adsorption data between $0.05<P/P_0<0.3$. The isotherm shows an unusual negative deviation at higher pressures which is currently unexplained. However, the reversibility of the isotherm both at high and at low relative pressures suggests it is equilibrated, that there are no leaks in the apparatus and that the heat of adsorption is leaving the sample so not causing any artefacts due to sample heating.