

# Supplementary Information to "Improved conductivity in dye-sensitised solar cells through block-copolymer confined TiO<sub>2</sub> crystallisation"

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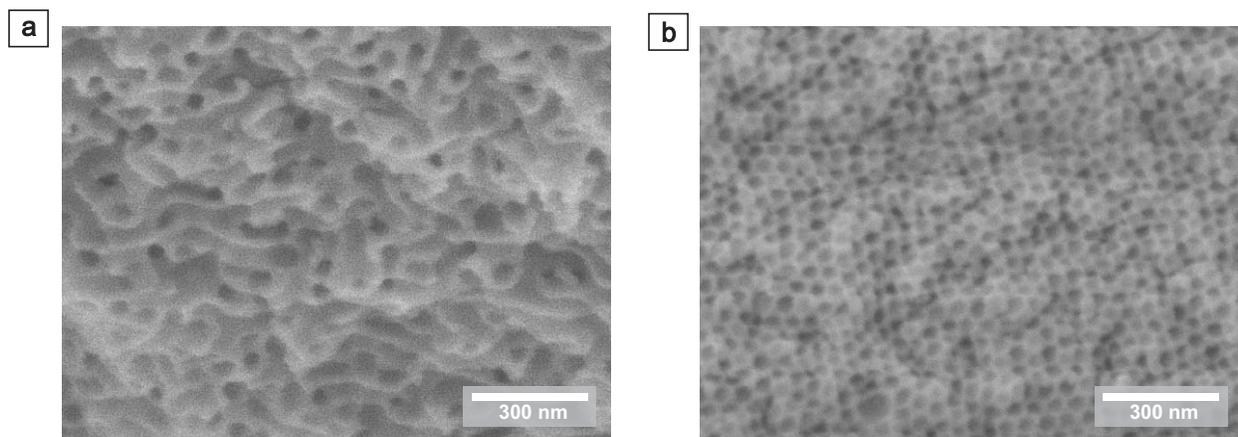


Figure 1: Effect of redissolving on film morphology. SEM cross-sectional images of calcined films spincoated from (a) a solution of hydrolytic sol and PI-*b*-PEO copolymer in THF; and (b) a solution of the hybrid material redissolved in an azeotrope of toluene and 1-butanol.

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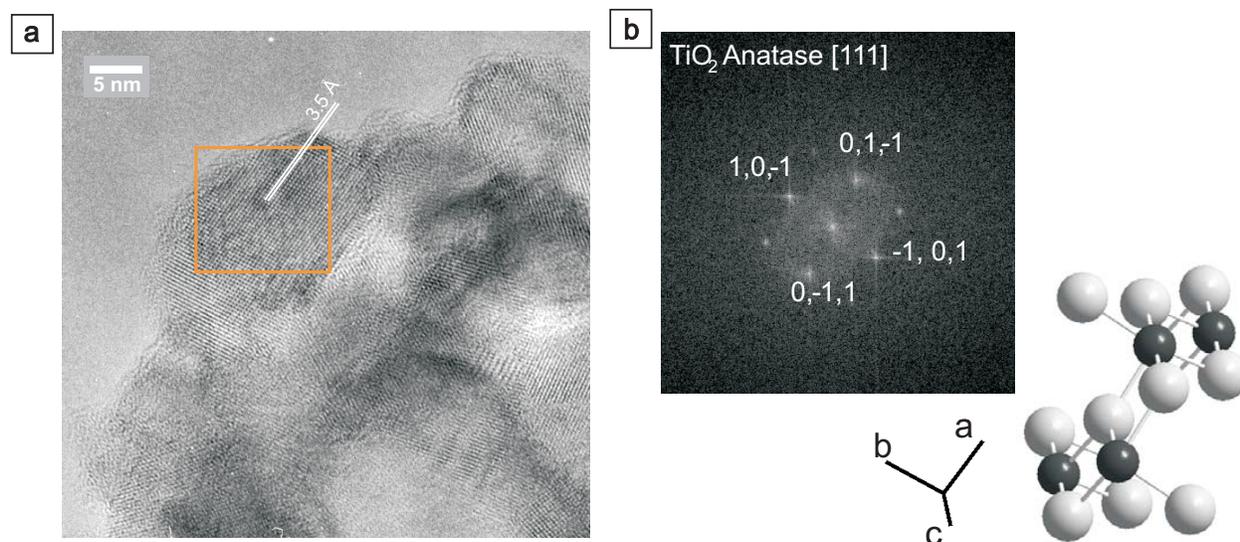


Figure 2: (a) High resolution TEM image taken from the sample annealed at 650 °C. The specimen is composed by highly crystalline anatase TiO<sub>2</sub>. The highlighted particle is imaged along the [111] zone axis and the structure is terminated by  $\langle \bar{1}01 \rangle$  planes. The computed Fast Fourier Transform (FFT) of the framed area is shown in (b), along with a sketch of the anatase unit cell and a simulated electron diffraction pattern.

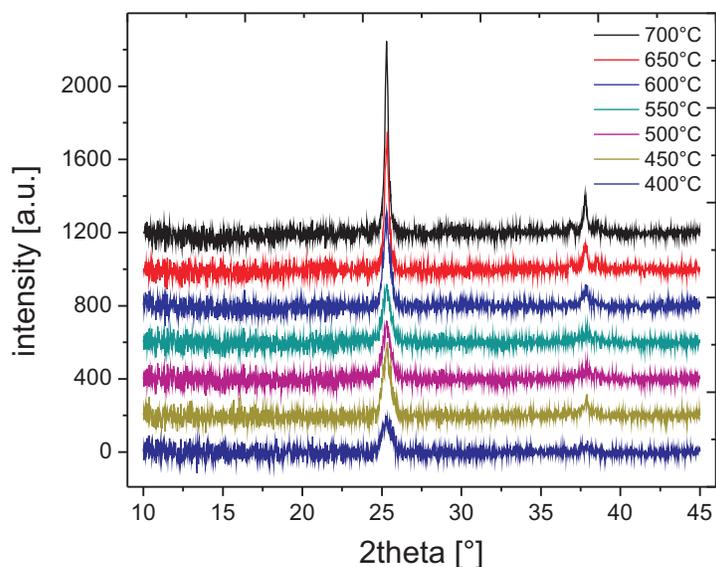


Figure 3: Transmission XRD scans of samples annealed at temperatures up to 700 °C. Results in transmission affirm the results from reflection, shown in Figure 2. No traces of rutile can be detected within the temperature range. The absence of a background hump at lower temperatures, makes assumptions on amorphous content speculative.

**Table 1: Photovoltaic device performance parameters**

annealing temperature	J [mA/cm <sup>2</sup> ]	V [V]	FF	$\eta$ [%]
solid state DSC				
350 °C	0.4	0.40	0.07	0.1
450 °C	2.4	0.78	0.48	0.8
500 °C	3.6	0.73	0.47	1.3
550 °C	4.5	0.75	0.49	1.6
600 °C	5.2	0.77	0.52	2.1
650 °C	5.0	0.81	0.53	2.1
700 °C	6.1	0.74	0.55	2.5
liquid electrolyte DSC				
400 °C	4.4	0.79	0.65	2.3
500 °C	4.2	0.77	0.62	2.0
650 °C	3.1	0.77	0.58	1.5