Polymer templated nanocrystalline titania network for solid state dye sensitized solar cells

Johannes C. Brendel,a Yan Lu,b Mukundan Thelakkat

a Applied Functional Polymers, Macromolecular Chemistry I, University of Bayreuth, 95440 Bayreuth, Germany

b Physikalische Chemie I, University of Bayreuth, 95440 Bayreuth, Germany
Electronic Supplementary Information (ESI)

High resolution transmission electron microscopy

Fig. S1  HR-TEM image of sample SPB-TiO$_2$-1 (SPB/TEOT/water ratio of 1/4/4) and the selected area
electron diffraction (SAED) patterns of a single crystal immobilized within the brush. The diffraction rings consist with the anatase phase of TiO2.

EDX spectra of calcinated samples

![EDX spectra](image)

**Fig. S2** EDX spectra of the SPB-TiO2 films were recorded after calcination under argon and after the final removal of the carbon composite in air. A high carbon peak at 0.2 keV was obtained after heating under Argon for 5 h at 500 °C (left). The right spectrum indicates the complete removal of the carbon after 30 min at 500 °C under air.

![EDX spectra](image)

**Fig. S3** Further inorganic impurities as sodium and sulphur were detected via EDX analysis. These rests of the sulfonate groups were removed by immersing the samples in Millipore® water for
1 h. The respective EDX spectra display the complete removal of those impurities.

TGA measurements

Fig. S4  TGA measurements of the samples SPB-TiO$_2$-1, SPB-TiO$_2$-2 and SPB-TiO$_2$-3. The program for the TGA measurement was adjusted to the two-step calcination program (under N$_2$: heating to 250 °C at a ramp of 10 K/min, keeping at 250 °C for 2 h, further heating to 500 °C at a ramp of 10 K/min, keeping at 500 °C for 5 h, flush with O$_2$ and keep for another 30 min at 500 °C). The residual relative masses of the individual samples are summarized in table S1.
Table S1 Relative residual masses determined by TGA measurements.

<table>
<thead>
<tr>
<th>Sample</th>
<th>TiO$_2$ content in SPB-TiO$_2$ composite</th>
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<tbody>
<tr>
<td>SPB-TiO$_2$-1d</td>
<td>37.68%</td>
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<tr>
<td>SPB-TiO$_2$-2</td>
<td>17.01%</td>
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<tr>
<td>SPB-TiO$_2$-3</td>
<td>42.23%</td>
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</tbody>
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