Supplementary Material (ESI) for Lab on a Chip

Supporting information.

A Comparative Synthesis of Titanium Oxide Nanostructures on the Bulk Scale and Using Microfluidic Chips

Ben F. Cottam, Siva Krishnadasan, Andrew J. DeMello, John C. DeMello, Milo S. P. Shaffer

Department of Chemistry, Imperial College London, London SW7 2AZ.

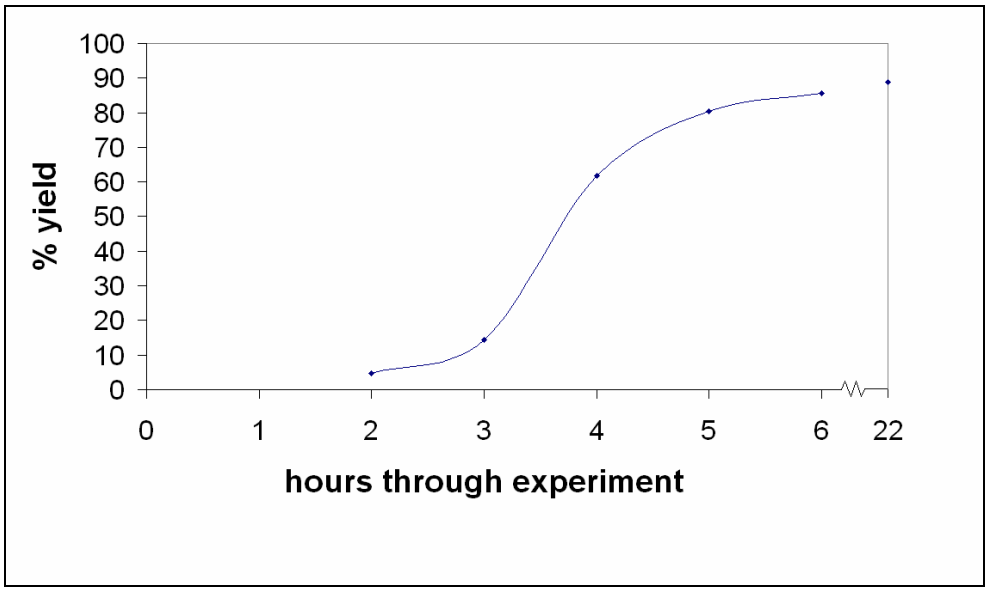

Figure S1. Yield data for batch synthesis.

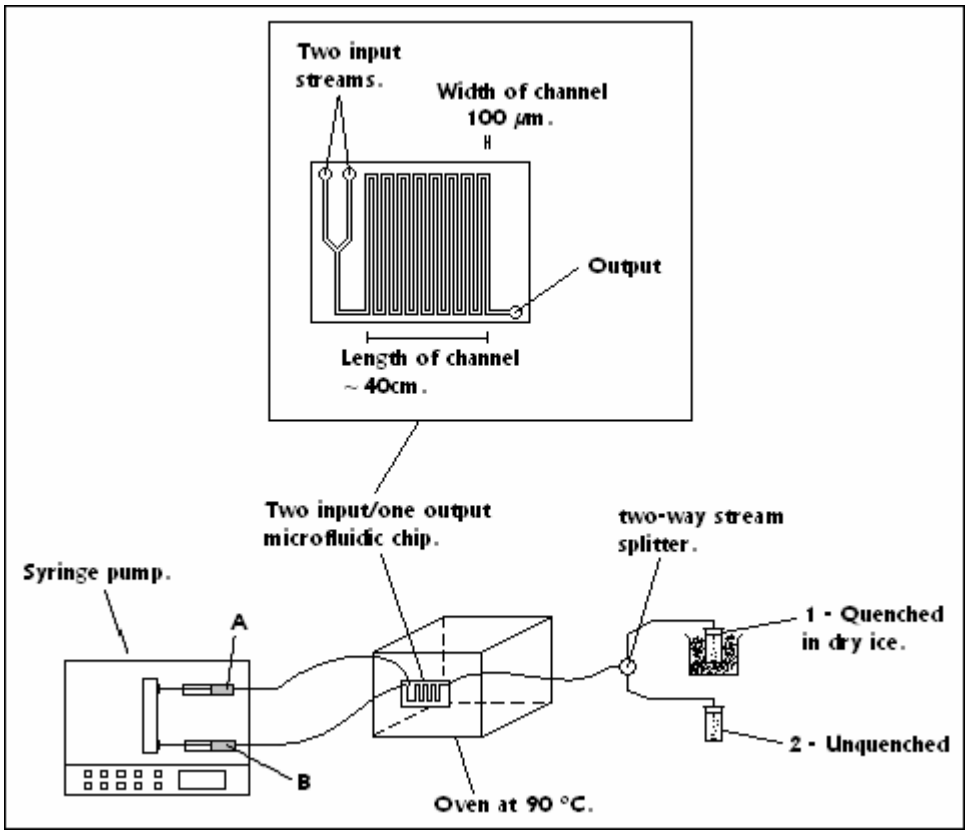

Figure S2. Schematic showing the microfluidic chip set-up and detail of the chip used.

Characterisation techniques.

Transmission electron microscopy (TEM) was performed using a JEOL JEM 2010 microscope operating at 200 kV. Samples were prepared by dropping dilute hexane solutions onto a carbon film supported on a 300 mesh copper grid. X-ray powder diffraction patterns were collected with a Philips X'Pert diffractometer Cu Kα radiation at a wavelength of 1.54 Å. Due to the small mass of material obtained from the microfluidic experiments it was not possible to perform conventional X-ray powder diffraction on these samples. Instead, a single-crystal Oxford Diffraction X'calibur 3 diffractometer was used, with ~3 mg dry powder suspended in a 0.7 mm inner diameter Lindemann tube.

Raman spectroscopy and X-ray diffraction spectra and thermogravimetric analysis plots.

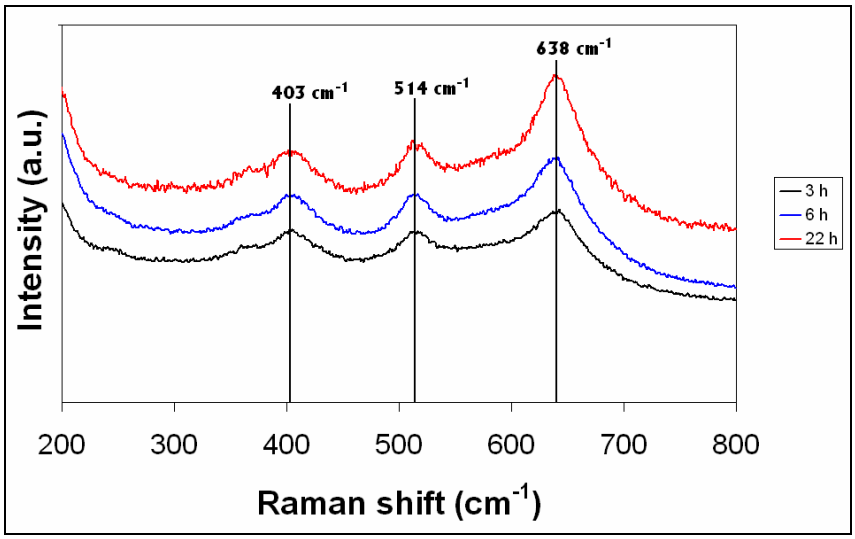

Figure S3. Raman spectra of batch reactions after 3, 6 and 22 hours.

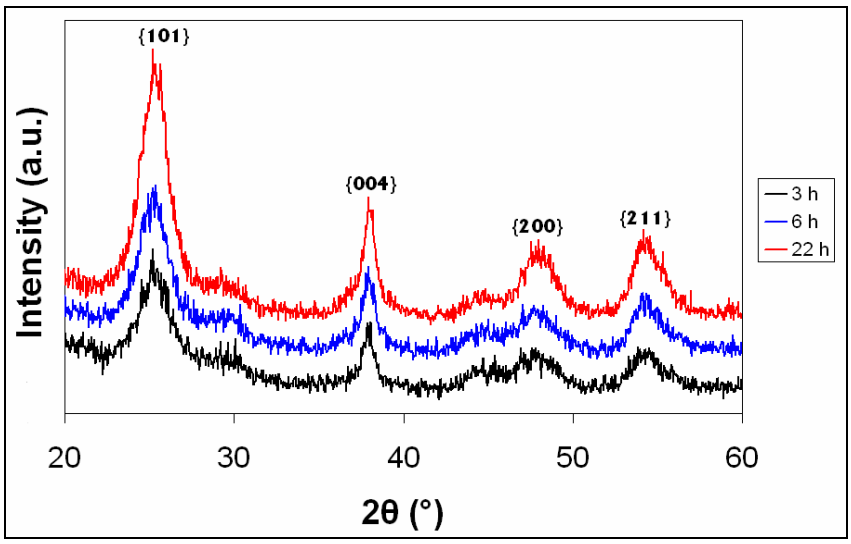

Figure S4. X-ray diffraction spectra of batch reactions after 3, 6 and 22 hours.

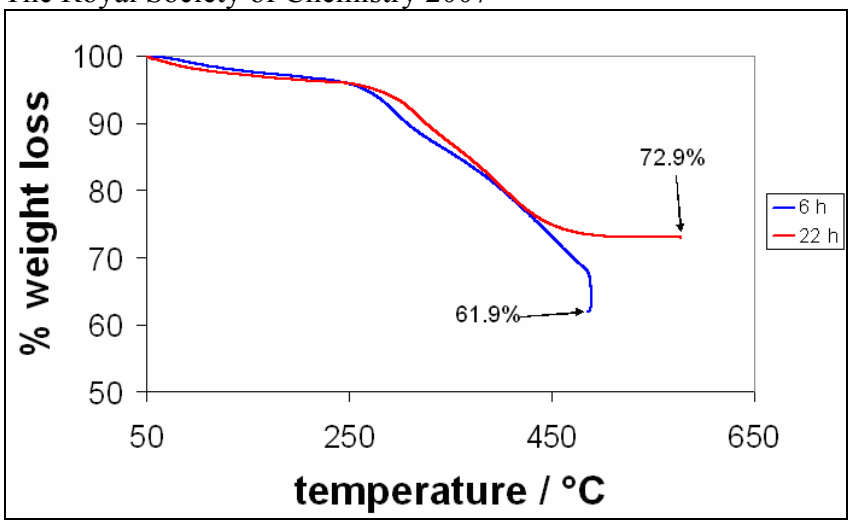

Figure S5. Thermogravimetric analysis plots (in air) of batch synthesised samples. Between 50 and 250 °C volatile organics (water/ethanol etc.) are lost, above 250 °C the oleic acid surfactant is burnt and above 500 °C only TiO_2 remains.

TEM images.

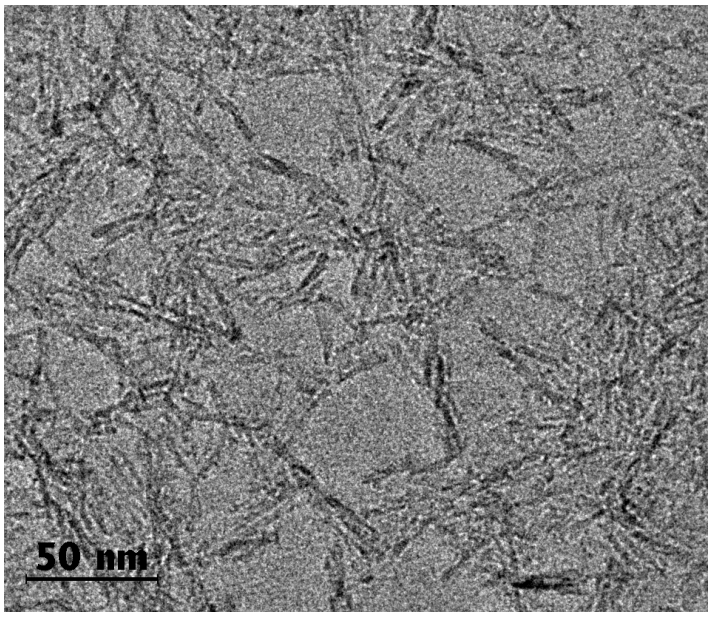

Figure S6. TEM image 1-D TiO_2 nanorods obtained after a batch reaction for 6 h.

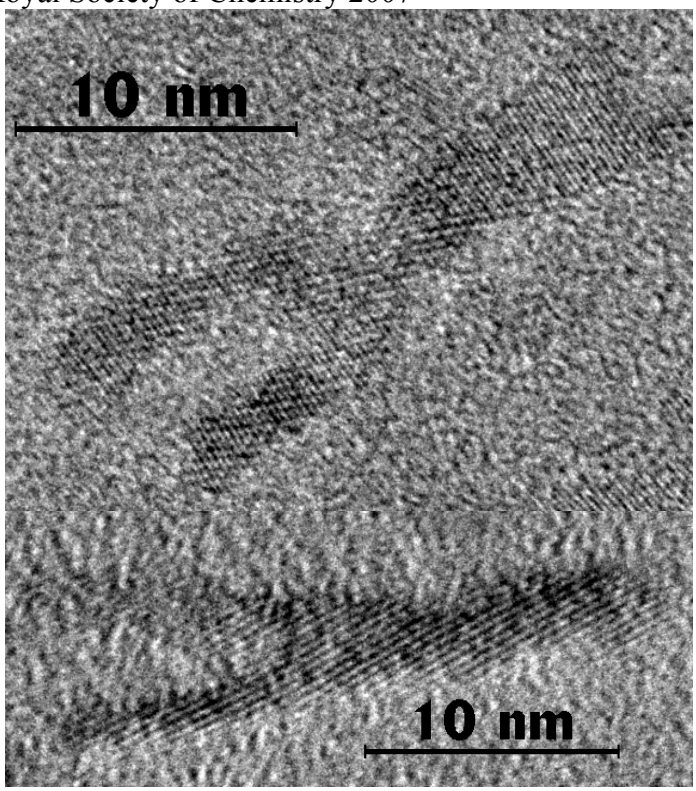

Figure S7. HRTEM images of branched structures formed after a batch reaction of 22 h.