Gas Phase Synthesis of Titania with Aerogel Character and its Application as a Support in Catalysis

Stefan Dilger, Christian Hintze, Michael Krumm, Carlos Lizandara-Pueyo, Salem Deeb, Sebastian Proch and Sebastian Polarz

SUPPLEMENTARY INFORMATION

SI-1

TGA data of Ti(OiPr)₄ in N₂ atmosphere.
SI-2

Concentration of the precursor in the aerosol determined experimentally (data points) and calculated theoretically (grey curve) as a function of the injection rate.
Photographic images of 0.5 g of different TiO$_2$ materials

The mass of each sample is 500 mg: (A) a commercially available TiO$_2$ powder (~100 nm crystal size of TiO$_2$ and BET surface area of 9.2 m$^2$/g), aerogel-like TiO$_2$ materials prepared in the gas phase using precursor flow rates of 50 (B), 15 (C) and 3 (D) $\mu$l/min.
SEM images of an alternative TiO$_2$ aerogel showing higher porosity
SI-5:

Evaluation of PXRD data.
SI-6:

Phase transition anatase $\rightarrow$ rutile determined from PXRD data.

Phase composition and residence time as a function of flow rate.
SI-7:

Influence of the residence time $\tau_{PFZ}$ on crystallite size for two different temperatures.
SI-8:

TEM images of the material shown in Fig. 5a at higher magnification.
TEM images of the material shown in Fig. 5b at higher magnification.
TEM images of the material shown in Fig. 5c at higher magnification.
SI-9:

Additional analytical data for the Au containing TiO₂ aerogel-like materials.

EDX-analysis of catalyst 2:
TEM data of catalyst 2 (0.9% Au, TiO$_2$); three magnifications:
PXRD-analysis: