Electronic Supplementary Material (ESI) for CrystEngComm.

Supplementary Information

Synthesis of Hollow Anatase Spheres with Enhanced Optical Performance

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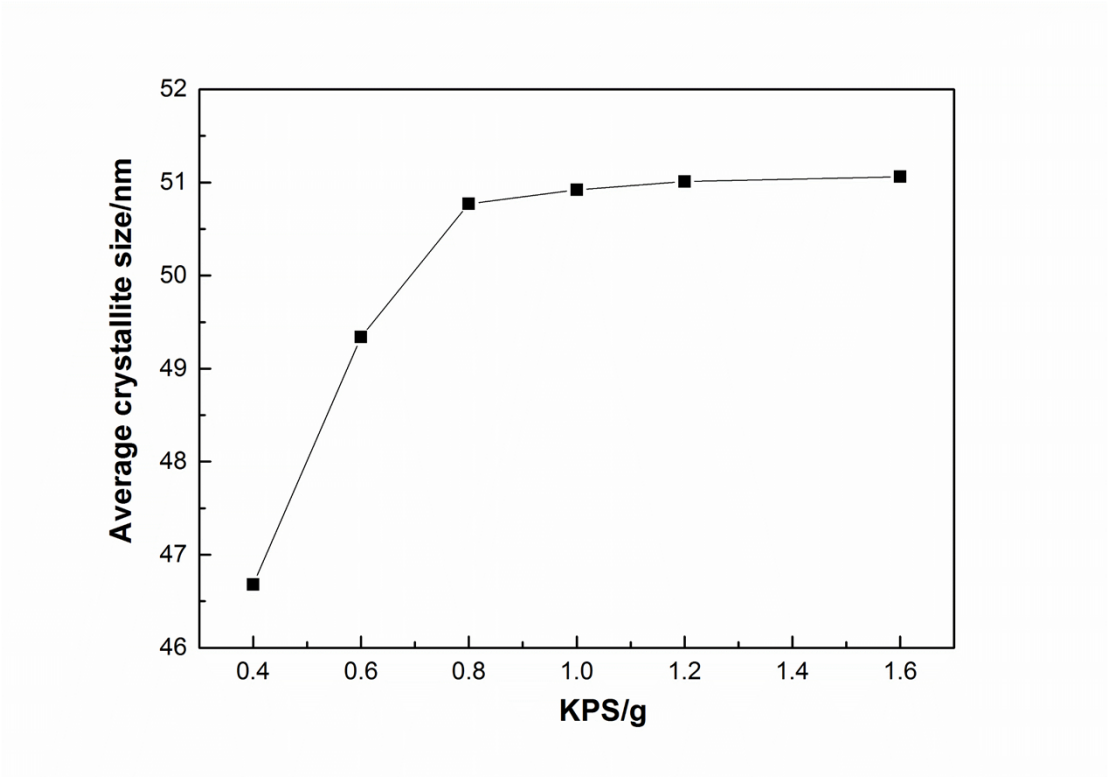
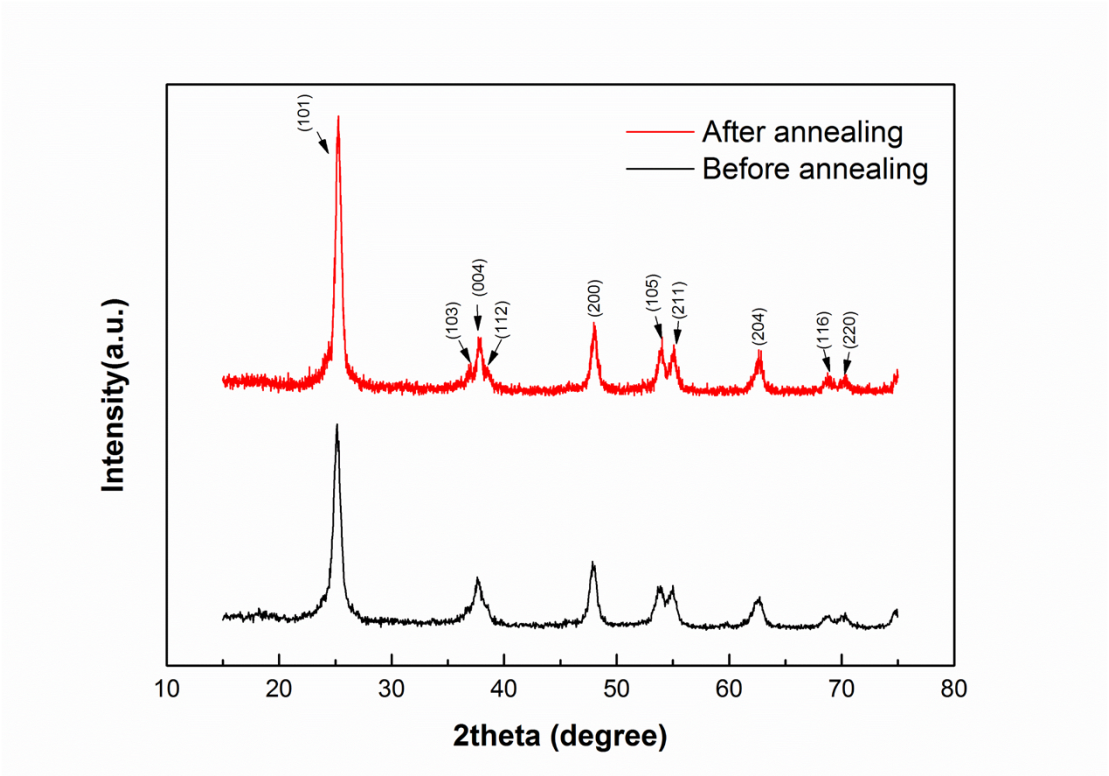


Figure S1. The average crystallite size of anatase sample with the increase of KPS.

We determined the crystallite size by using the Debye-Scherrer formula given by $D_{hkl} = k\lambda/\beta\cos\theta$， where D_{hkl} is the crystallite size estimated from the (hkl) line, k is the Scherrer constant, β is the half-width, λ is the X-ray wavelength, and θ is the diffraction angle. The average crystallite sizes for AT-KPS-0.4 (nanoparticles), AT-KPS-0.6, AT-KPS-0.8, AT-KPS-1.0, AT-KPS-1.2, and AT-KPS-1.6 are 46.68 nm, 49.34 nm, 50.77 nm, 50.89 nm, 51.01 nm, and 51.06 nm, respectively. The results indicate that the average grain size of anatase sphere increases slightly with the increase of KPS.



3. Figure S2. The XRD patterns of AT-KPS-1.0 before and after annealing.

In order to remove the PS core and free carbon completely[#], the samples were annealed at 500 °C for 4 h with a heating rate of 5 °C/min (most of the PS) and then 600 °C for 2 h with a heating rate of 2 °C/min (free carbon). The second part of annealing process with a small heating rate also helps to reduce the possibility of structural collapse. Before annealing, AT-KPS-1.0 obtained directly after the hydrothermal treatment shows the crystal structure of anatase; after annealing, the crystallization gets some improve.

Haiqiang Wang, Zhongbiao Wu and Y. Liu, *J. Phys. Chem. C*, 2009, **113**, 13317-13324.