Supporting Information for Publication

Determination of the midgap state energy levels of anatase TiO_2 nanocrystal film by nanosecond transient IR absorption – excitation energy scanning spectra

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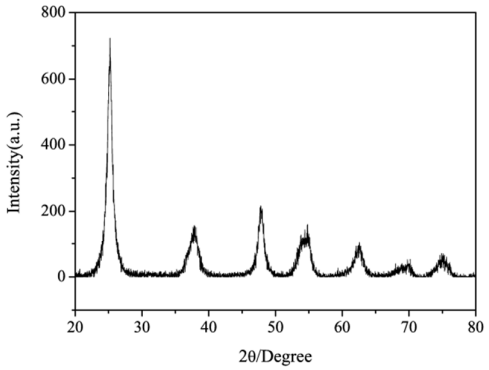

Figure S1. X-ray diffraction (XRD) pattern of TiO_2 powder. X-ray diffraction (XRD) patterns were recorded on a diffractometer (Rigaku D/max-2500, Japan) using CuKa radiation at 45 kV and 250 mA and scan rate of 0.15° 2θ per second. The pattern exhibits intense diffraction peaks at 2θ=25.22°, 37.88°, 47.80°, 54.79°, 62.58°, 69.95° and 75.07°, all peaks are in good agreement with the standard spectrum of anatase TiO_2 (JCPDS 21-1272), corresponding to the diffractions from the (101), (004), (200), (211), (204), (220), (215) crystal planes of anatase TiO_2 respectively, indicating TiO_2 in the anatase phase. The nanocrystal size was calculated to be 7.9 nm by Scherrer equation $D = K\lambda/B\cos\theta$, where D accounts for the average crystal size, K = 0.89 is the Scherrer coefficient, λ is the wavelength of the X-ray radiation (λ=0.15406 nm), B is the full width at half-maximum (FWHM) and θ is the diffraction angle (Zachariah, A.; Baiju, K.V.; Shukla, S.; Deepa, K. S.; James, J.; Warrier, K. G. K. *J. Phys. Chem. C*, **2008** 112, 11345–11356).