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Insights into the roles of organic coating in tuning the defect chemistry of monodisperse TiO_2 nanocrystals for tailored properties

Liping Li,[a] Guangshe Li,[b] Jiaoxing Xu,[b] Jing Zheng,[a] Wenming Tong,[b] Wanbiao Hu[b]*

[a]*Key Laboratory of Optoelectronic Materials Chemistry and Physics, Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou 350002, People's Republic of China,*

[b]*State Key Lab of Structural Chemistry, Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, Fuzhou 350002, People's Republic of China*

Supporting Online Materials

Figure S1 Experimental sketch of UV light illumination for removal of organic coating without and with water cooling.

Figure S2 Particle size distribution of the nanoparticles.

Figure S3 TG and QMS data for the nanoparticles after irradiation.

Figure S4 IR spectra of the nanoparticles after irradiation.

Figure S5 TG curve of the monodisperse TiO_2 nanoparticles with organic coating.

Figure S6. UV-visible diffuse reflectance spectrum of the TiO_2 nanocrystals obtained after annealing the pure anatase TiO_2 in vacuum at 100^oC for 72h.

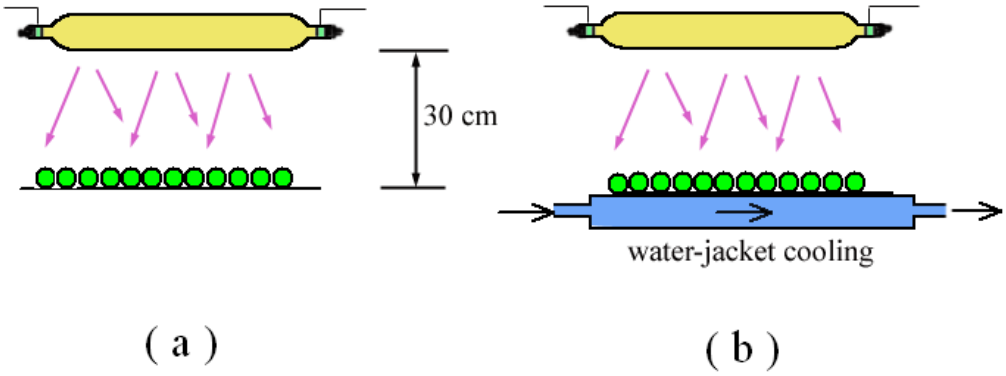

Figure S1 Experimental sketch of UV light illumination for removal of organic coating. (a) and (b) represent the illumination were carried out in the condition of without and with water cooling, respectively.

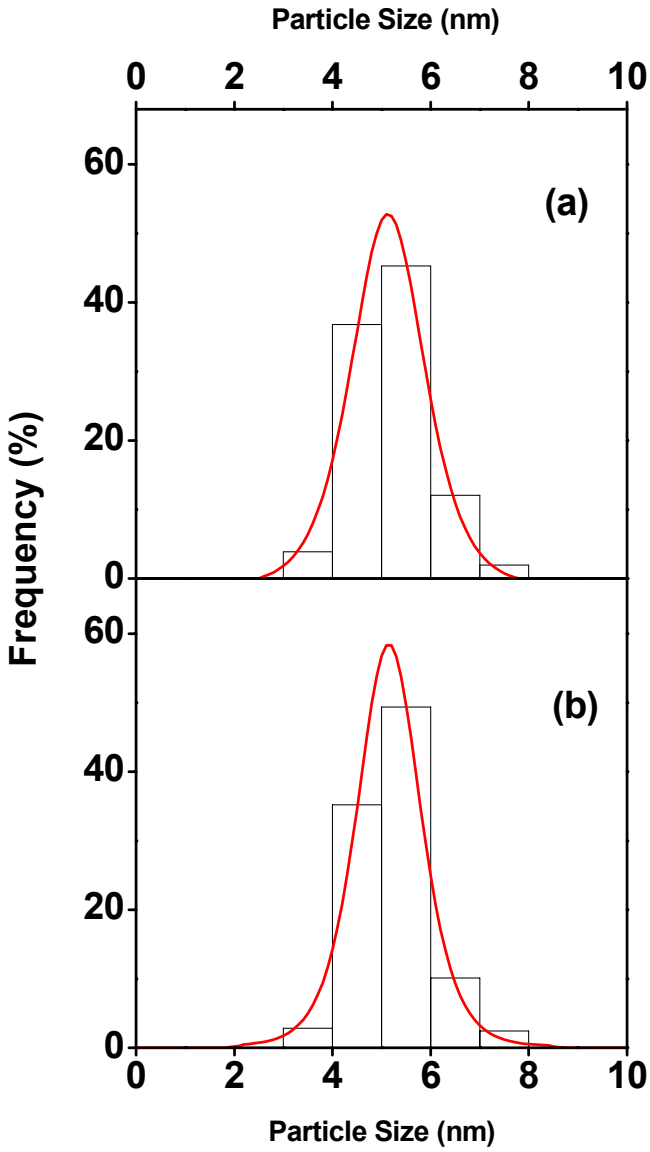

Figure S2 Particle size distribution for (a) the monodispersed and (b) the irradiated nanoparticles.

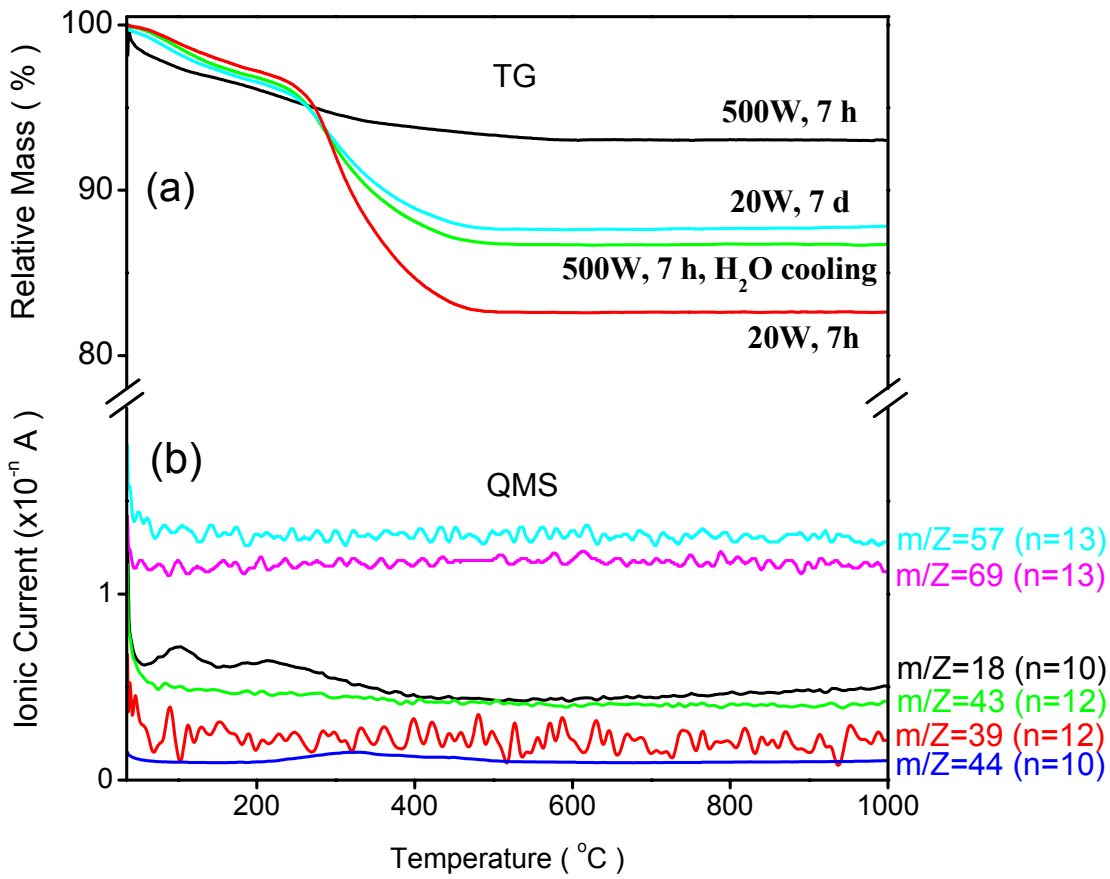

Figure S3 (a) TG curves for the monodispersed TiO_2 nanoparticles when irradiated under given conditions, and (b) QMS signals of product after irradiated under 500 w UV light for 7 h. Only weak signals of H_2O (m/Z=18) and CO_2 (m/Z=44) were detected. Term *m/Z* in QMS data represent mass-to-charge ratio. The intensity unit of QMS signal is ionic current, and the value of *n* in the parentheses represents the order of magnitude of ionic current.

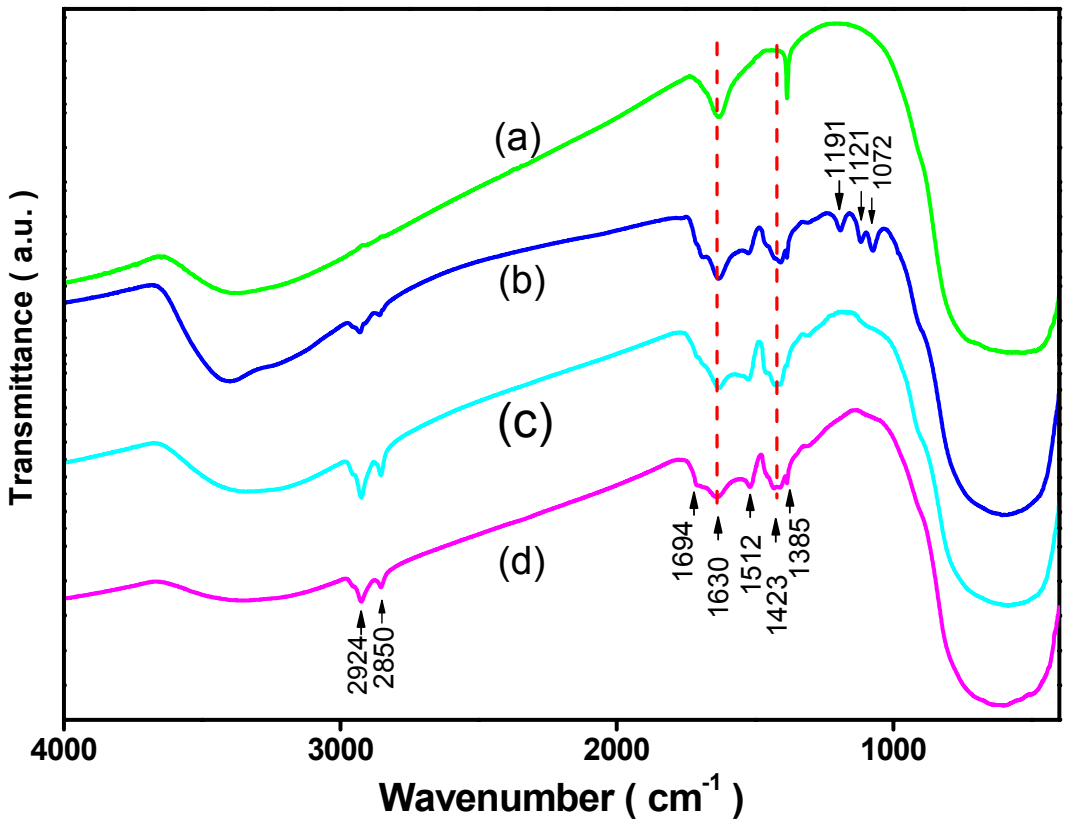

Figure S4 IR spectra of the products when the monodispersed nanoparticles were irradiated by 500 w UV light for 7 h (a) without and (b) with water cooling, (c) the product after 20 w UV irradiation, and (d) the product obtained by annealing the monodisperse nanoparticles at 150 ^{o}C for 7 h. The observation of vibrations in the range of 2800 to 3000 cm^{-1} for (b), (c) and (d) indicated that the organic coating did not remove completely.

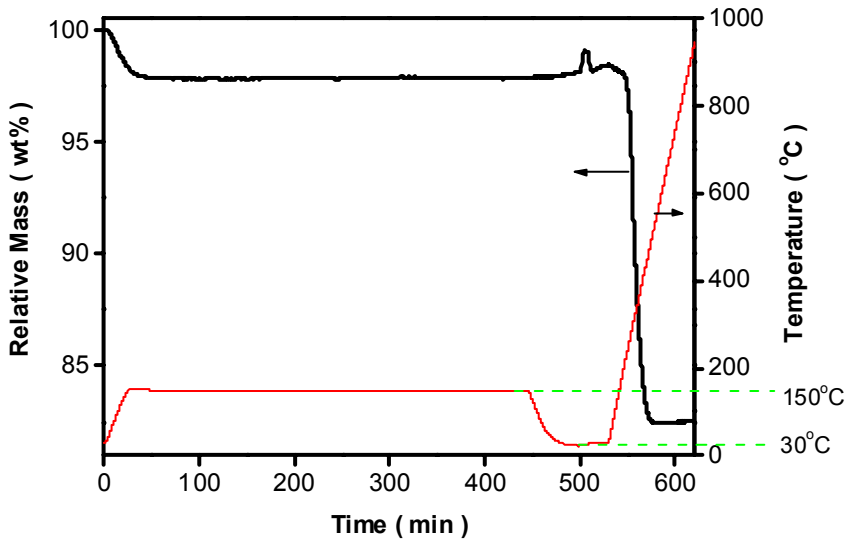

Figure S5 TGA curve of the as-prepared monodisperse TiO_2 nanoparticles capped by OA-related species**.**

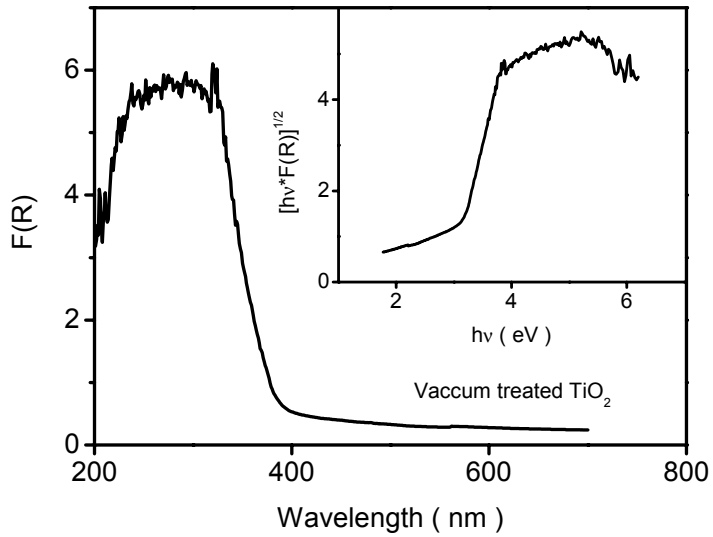

Figure S6 UV-visible diffuse reflectance spectrum of the TiO_2 nanocrystals obtained by annealing the high purity anatase TiO_2 in vacuum at 100°C for 72h (bottom). Inset shows the energy dependence of $(h\nu*F(R))^{1/2}$.