Supporting Information for:

Improved Catalytic Capability of Mesoporous TiO_2 Microspheres and Photodecomposition of Toluene

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Pages (including the cover page): 8

Contents: a procedure and four figures (Figure S1-S4)

Annotation I: The detailed static vacuum gas distribution process is as follows: When completely cooled down, the reactor was evacuated by a vacuum pump with vacuum degree reaching 0.09 Mpa, subsequently 10 μL toluene was injected into the reactor using a microsyringe (Gaoge, Shanghai), within a few seconds after it reaching complete evaporation, air having been filtered by activated carbon fibers to control relative humidity and carbonaceous matters was introduced into the reactor. The relative humidity and temperature of the final gas were measured by a thermo-hygromer (testo 605-H1, German).

Annotation Ⅱ: SEM and TEM were adopted to investigate catalysts treated under different temperatures, and the corresponding pictures were shown in Figure S1 and Figure S2, respectively.

Annotation III: UV-vis analysis of all the used photocatalysts were given in Figure S3, with detection wavelength ranging from 200 to 1200 nm. According to the result, the absorption ability order at 295 nm of the synthesized samples are: Ti800> Ti400> uncalcined samples> Ti500> Ti100> Ti300> Ti600> Ti200> Ti700. Ti600 and Ti700 exhibit pronounced visible light absorption at $\lambda > 420$ nm.

Annotation Ⅳ: The TG-DTA curves of the prepared samples and P_{25} are described in Figure S4. As for the uncalcined samples with total mass loss about 12%, an endothermic peak appears at about 56 ℃ corresponding to the evaporation of ethanol adsorbed on the surface and one exothermic peak at 251 ℃ can be attributed to the combustion of the organic substances which might be

induced during preparation. With higher calcination temperature, total mass loss decreases, even when up to or above 400 ℃, there is no mass loss at all, which indicates the high purity and thermal stability of the higher temperatures calcined-samples.

Figure captions

Figure S1 SEM images of catalysts sintered under various temperatures and the corresponding magnified SEM images (a. low magnification; b. low magnification)

Figure S2 TEM images of catalysts calcined under different temperatures (a. low expansion pictures; b. magnified pictures)

Figure S3 UV-vis spectra of P_{25} and the prepared samples calcined at different temperatures

Figure S4 TG-DTA curves of P_{25} and prepared samples calcined at different temperatures

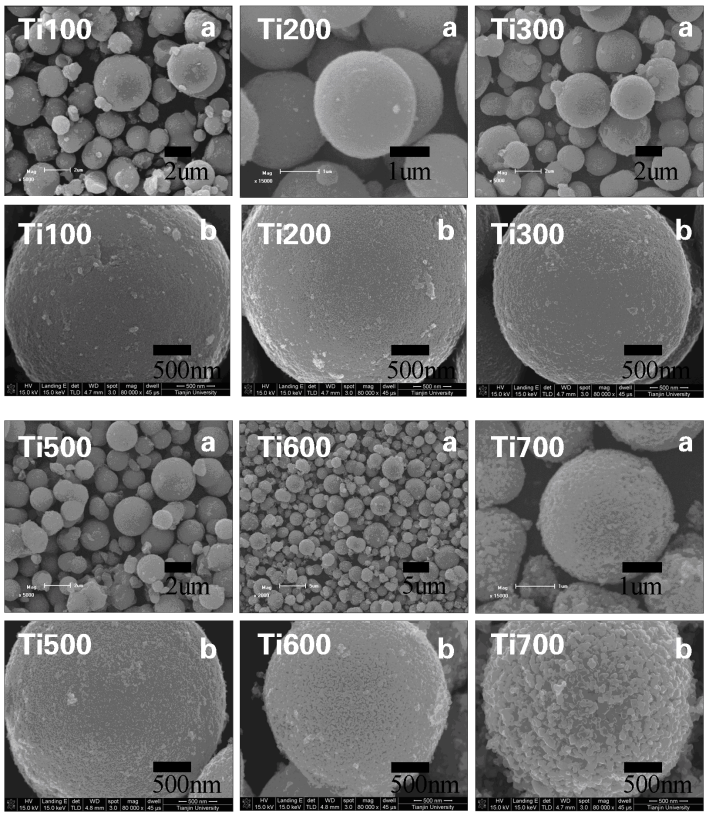

Figure S1 SEM images of catalysts sintered under various temperatures and the corresponding magnified SEM images (a. low magnification; b. low magnification)

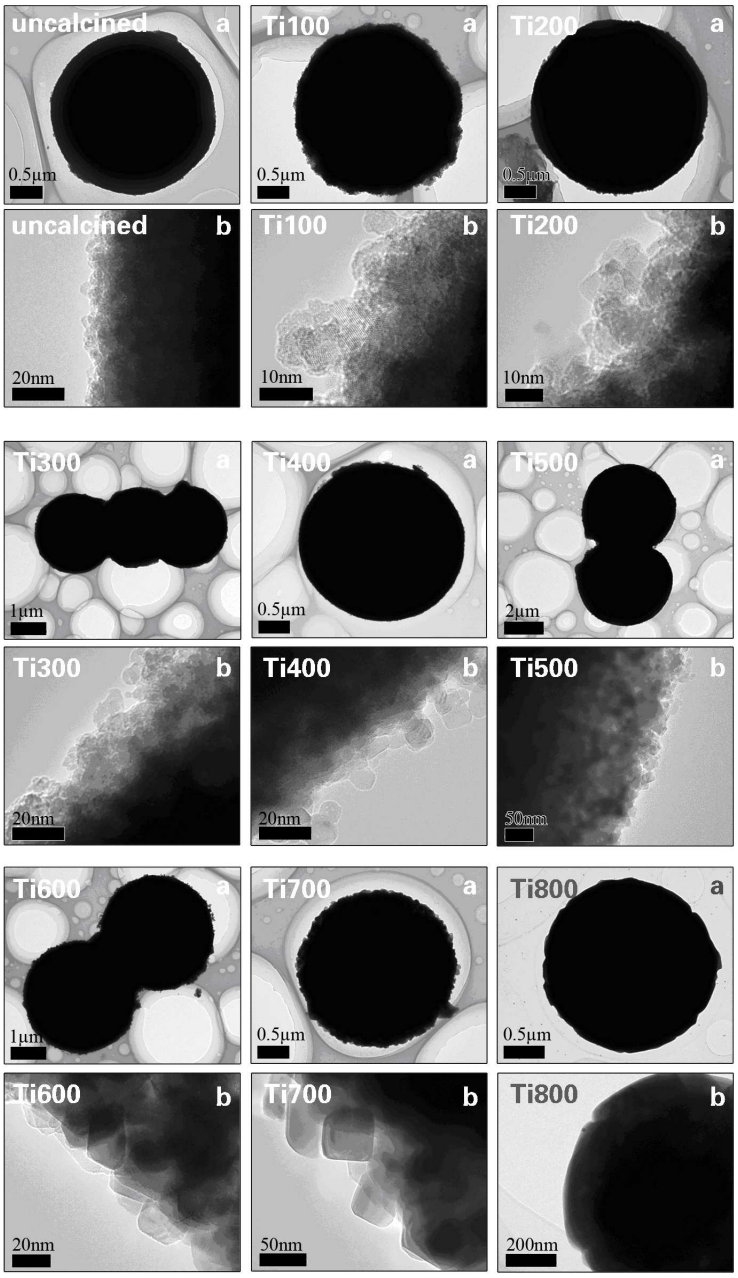

Figure S2 TEM images of catalysts calcined under different temperatures (a. low expansion pictures; b. magnified pictures)

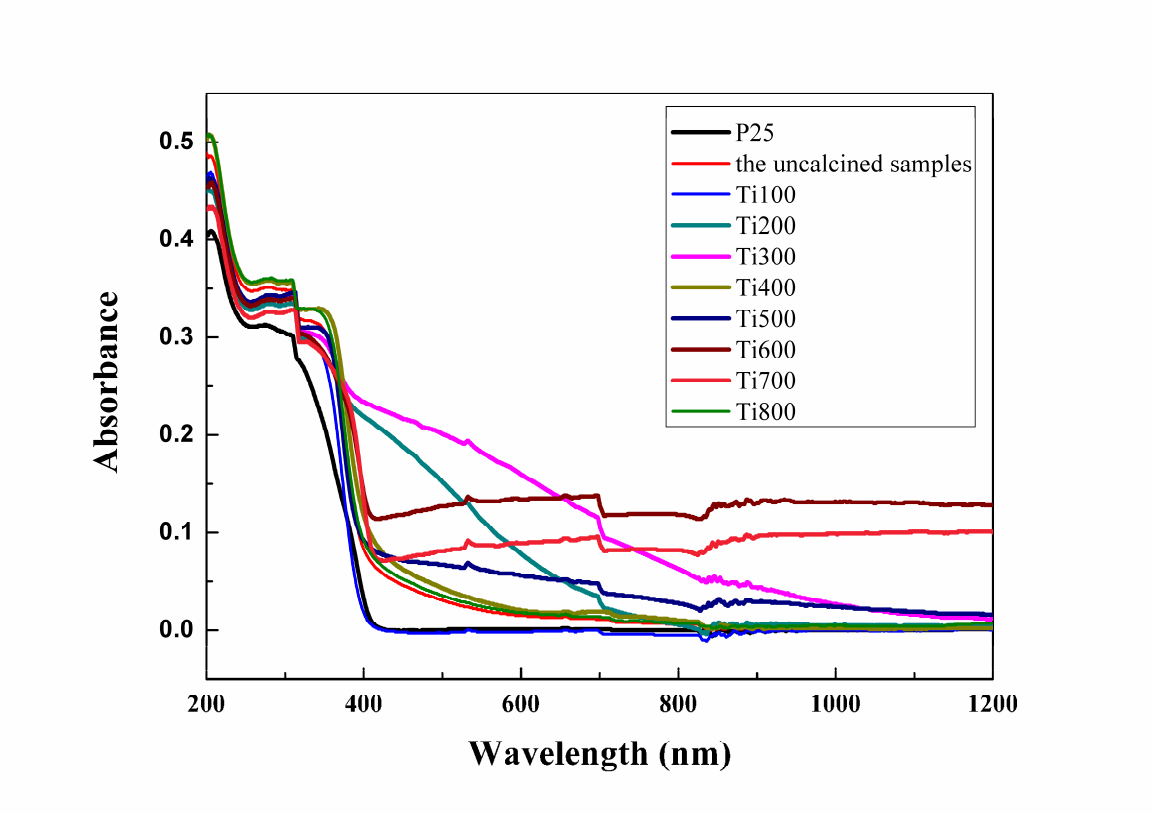

Figure S3 UV-vis spectra of P_{25} and the prepared samples calcined at different temperatures

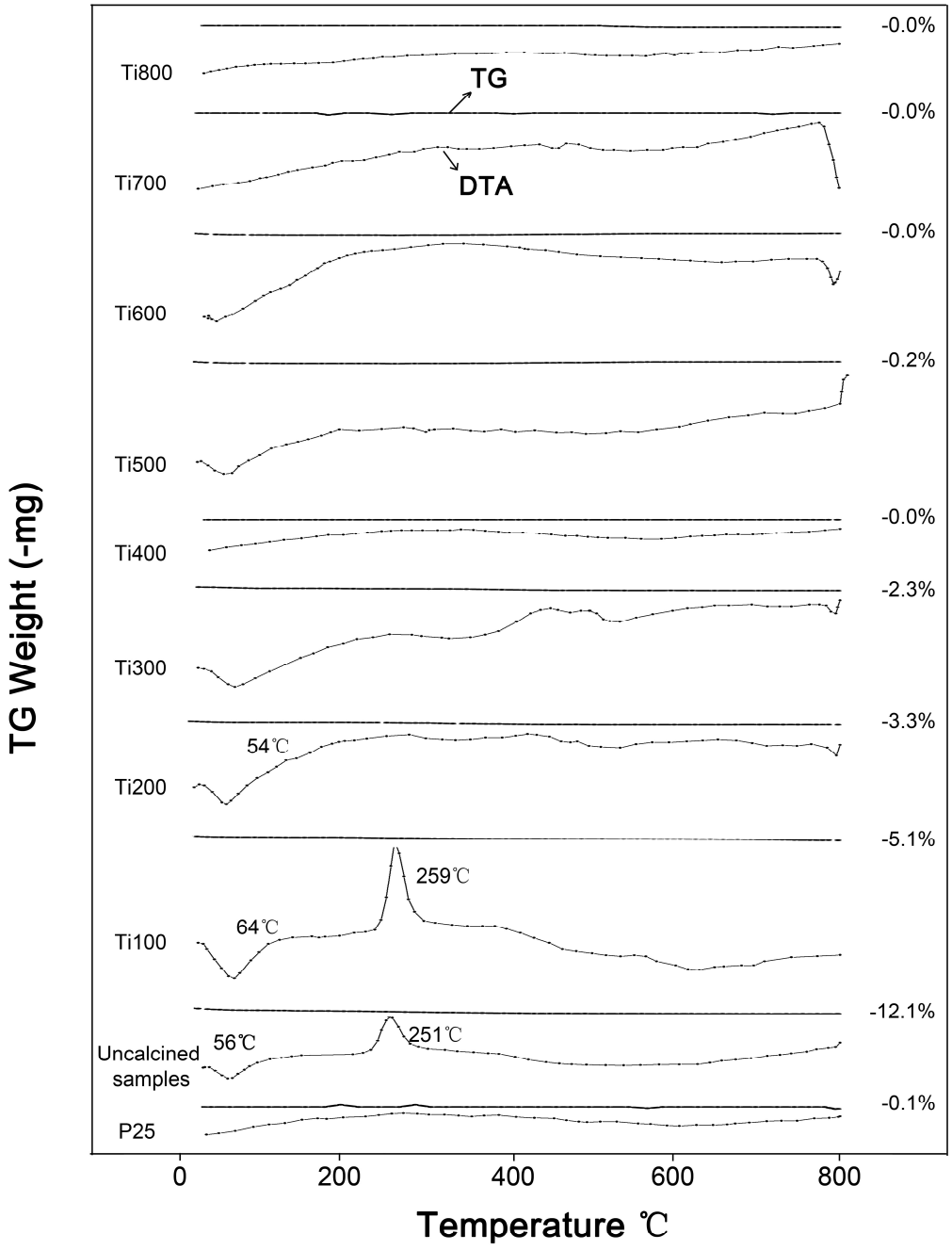

Figure S4 TG-DTA curves of P_{25} and prepared samples calcined at different temperatures