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Supplementary Information

In Situ Growth of TiO_2/SiO_2 Nanospheres on the Glass Substrates via Solution Impregnation for Antifogging

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The EDS analysis of the unheated TiO_2/SiO_2 nanospheres has been provided in the ESI file as Fig. S1, from which the distinct peak of C was observed. Considering of the almost invisible peak of C in the heated sample (Fig. 2b), it can be perceived that the carbon in the system was almost completely removed. What's more, the element distribution (Ti, Si and C) from EDS mapping of the TiO_2/SiO_2 nanospheres before and after the calcination treatment has been provided in the ESI file as Fig. S2. As shown in Fig. S2, the carbon element concentrated in the cavity of the nanospheres before the calcination and disappeared after the heat treatment. The result proved the spherical multilamellar vesicle template structure forming the lamellar phases in the immersing solution and the complete removal of the template after the calcination treatment.

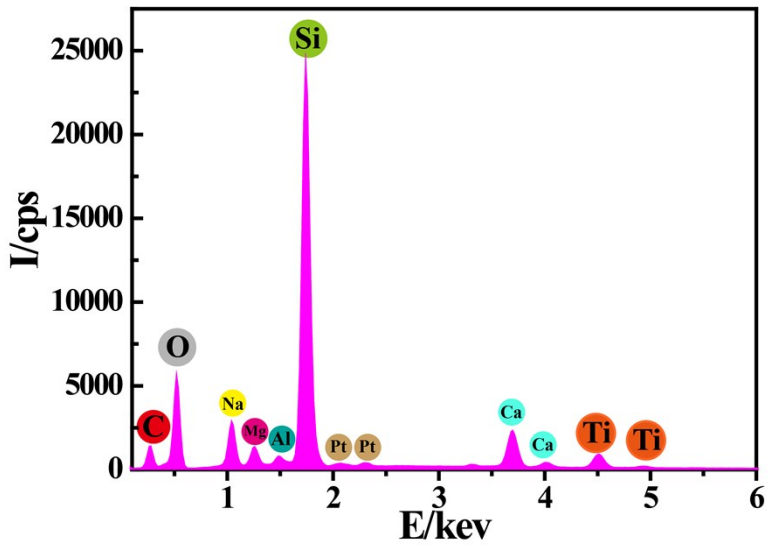

Fig. S1 EDS analysis of the unheated TiO_2/SiO_2 nanospheres.

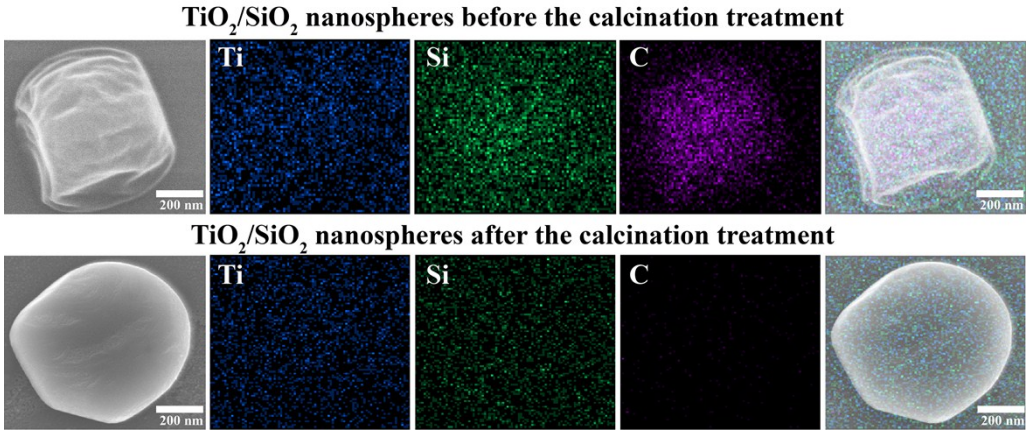

Fig. S2 Element distribution (Ti, Si and C) from EDS mapping of the TiO_2/SiO_2 nanospheres before and after the calcination treatment.

The magnification FESEM image of the rod-like nicks has been provided in the ESI file as Fig. S3. The average size of rod-like silica particles is at the length of about 125 nm and diameter of 15 nm from the heated sample SP_6. The size of the circular holes is about 500 nm from the heated sample SP_{12}. The size of the bowl-like structure is about 300 nm from the heated sample SP_{24}. The size of the spherical structure is about 800nm from the un-heating SP_{48}.

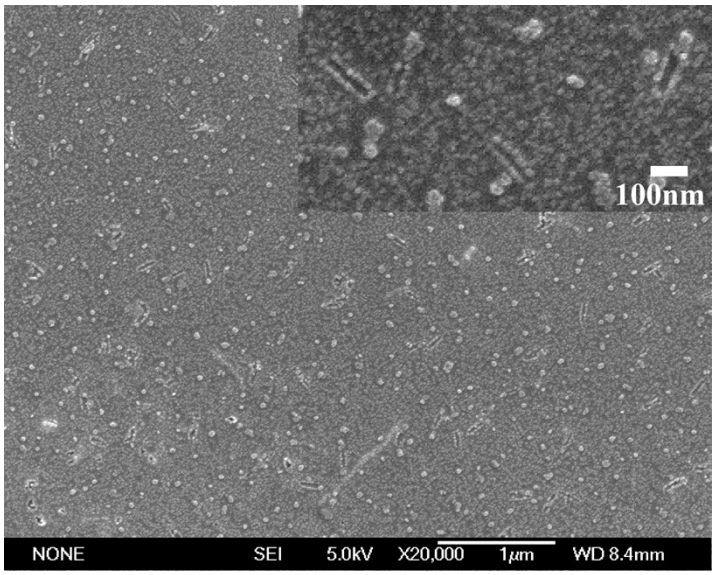

Fig. S3 Magnification FESEM image of in situ growing SiO_2 particles with 6h immersing time.

The powders of the heated samples (SP_{48} and TiO_2/SiO_2) were collected from the glass substrates and FTIR analysis was taken. The result has been provided in the ESI file as Fig. S4. As seen from Fig. S4, the characteristic peaks of CTATos at 3034, 2918 and 2849 cm^{-1} weren't observed[S1].

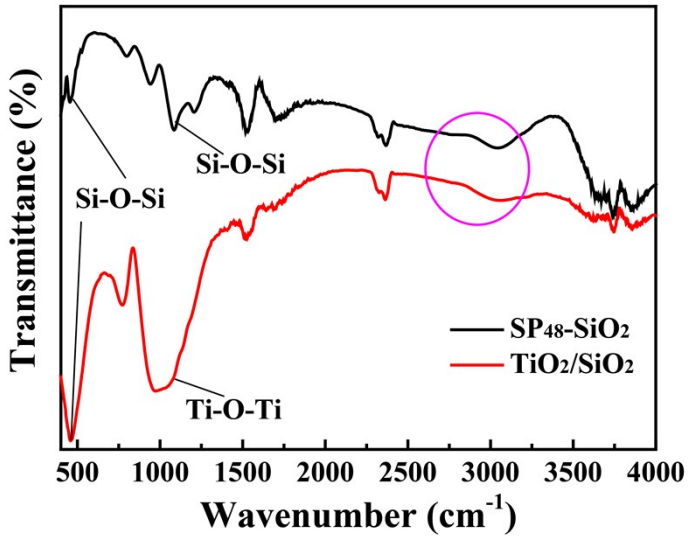

Fig. S4 FT-IR spectra of the heated sample SP_{48} and TiO_2/SiO_2 nanospheres.

The TEM image of TiO_2/SiO_2 nanospheres have been taken and provided in the ESI file as Fig. S5. We suspect that the hollow structure was not observed because of the huge size and the thick shells of nanospheres.

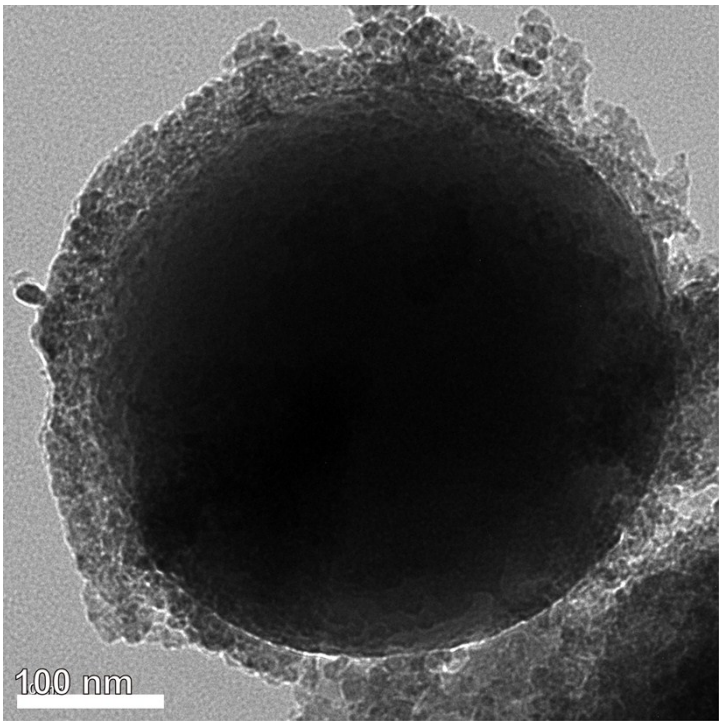

Fig. S5 TEM image of TiO_2/SiO_2 nanospheres

Reference:

S1 J. F. A. Soltero and J. E. Puig, Langmuir, 1995, **11**, 3337-3346.