Construction of Size-Controllable Hierarchical Nanoporous TiO$_2$ Ring Arrays and Their Modifications

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Electronic Supplementary Information

The polystyrene sphere (PS) colloidal monolayer, shown in Fig. S1, was synthesized by spin-coating on glass.

![SEM image of 4.5 μm PS colloidal monolayer. The inset is an enlarged image](image)

**Fig. S1.** SEM image of 4.5 μm PS colloidal monolayer. The inset is an enlarged image

The annealed colloidal monolayer was used as a template to fabricate TiO$_2$ ring arrays. The ring size was controlled by the annealing time and the precursor concentration in large area. Fig. S3 is a large area (90 μm X 60 μm) SEM image of the rings.
After a two-step heat treatment at 120°C and 400°C, the rings were composed of mostly anatase TiO$_2$ with trace amounts of rutile and brookite.

Fig. S2 Large area ring array fabricated under the same conditions as that of Fig. 5B.

![Fig. S3 XRD pattern.](image)

Fig. S3. XRD pattern.