Supporting Information for:

Synthesis of anatase TiO$_2$ nanoshuttles by self-sacrificing of titanate nanowires

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Figure S1. Raman spectra of the H-titanate nanowires

Figure S1 shows the Raman spectra of the precursor titanate nanowires with rough lines and weak intensities. The bands centered at approximately 144 cm$^{-1}$, 188 cm$^{-1}$, 265 cm$^{-1}$, 450 cm$^{-1}$ and 680 cm$^{-1}$ are consistent with the reported data of the bulk
$\text{H}_2\text{Ti}_3\text{O}_7$ and each band represents a different titanium and oxygen stretching vibration in the TiO$_6$ octahedra$^{1-5}$.

Figure S2. TEM image of the product obtained by hydrothermally treating the H-titanate nanowires (a) for 36h under neutral condition and (b) for 18h under acidic condition.

The effects of pH value on the products were carried out under neutral and acidic conditions. Figure S2 represent the typical TEM images of the products under neutral and acidic conditions, respectively. The morphologies are quite different from the product prepared under pH=12, which maintain the wire morphology even with rupture of the titanate nanowires, indicating the phase and shape transition based on the in situ topochemical reaction$^{6-7}$ and indirectly demonstrating the dissolving effect of concentrated hydroxyl groups on the titanate$^8$.

Figure S3. SEM image showing the early stage of the anatase formation on a titanate nanowire.
Figure S4. TEM and corresponding HRTEM images showing two sets of the lattice fringes with parallel reaction of the titanate nanowire/anatase TiO₂ composite.

Reference: