

Electronic supplementary information (ESI)

Fig. S1. X-ray diffraction patterns of 3-D arrays of TiO₂ nanotubes with lengths of (a) 260 nm, (b) 1200 nm and (c) 2000 nm on Ti mesh.

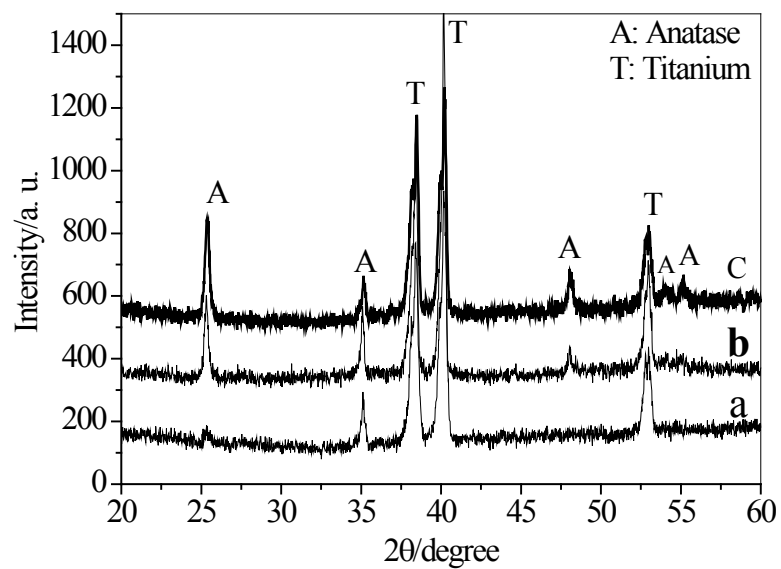


Fig. S2. (a) Top view and (b) cross-sectional images of 2-D arrays of TiO₂ nanotubes on Ti foil prepared by anodization of Ti foil in 0.5% HF solution for 20 min.

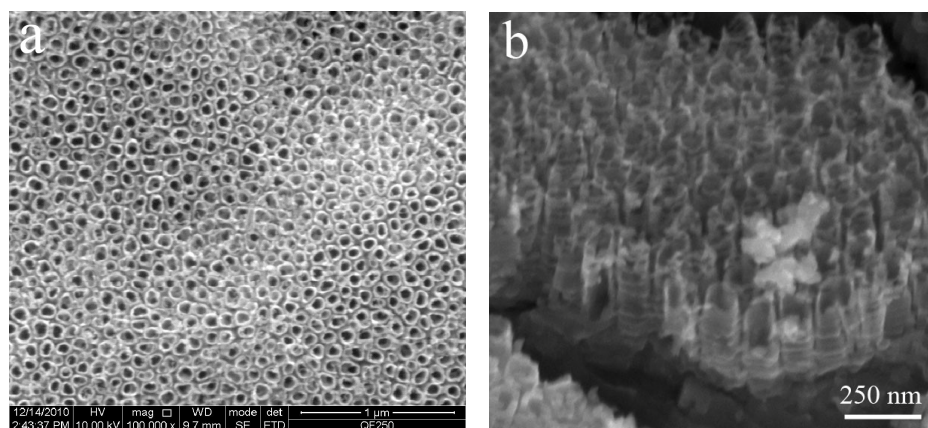


Fig. S3. Schematic diagrams of the photoanodes composed of 3-D and 2-D arrays of TiO_2 nanotubes.

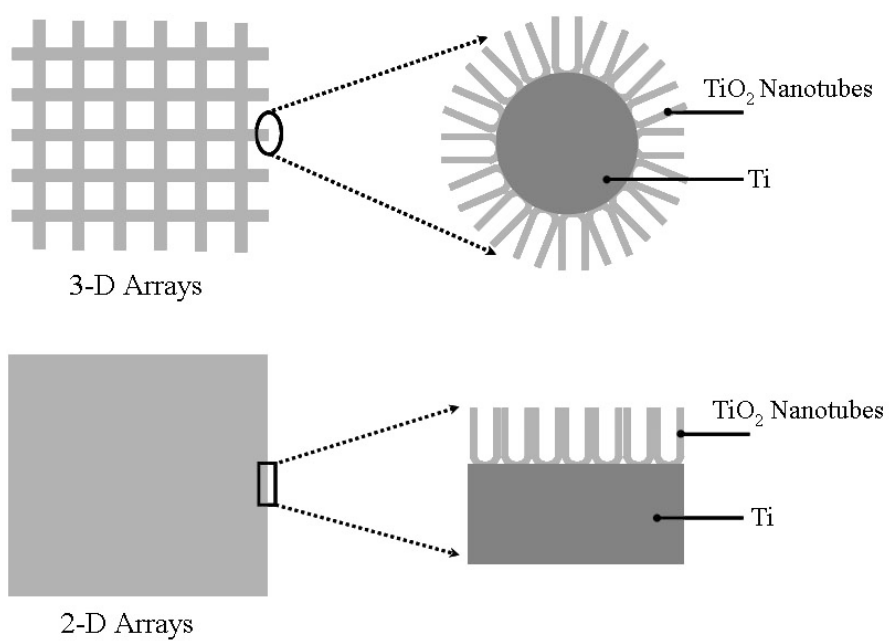


Fig. S4. (a) Top-view and (b, c) cross-sectional images of 3-D arrays of TiO₂ nanotubes on Ti mesh prepared by anodization in 0.25 wt % ammonium fluoride containing 2 vol % Milli-Q water in ethylene glycol for 10 min. Note that the surface of the sample were covered by a layer of porous TiO₂. The sample prepared by anodization for 5 min demonstrated a similar structure except the length.

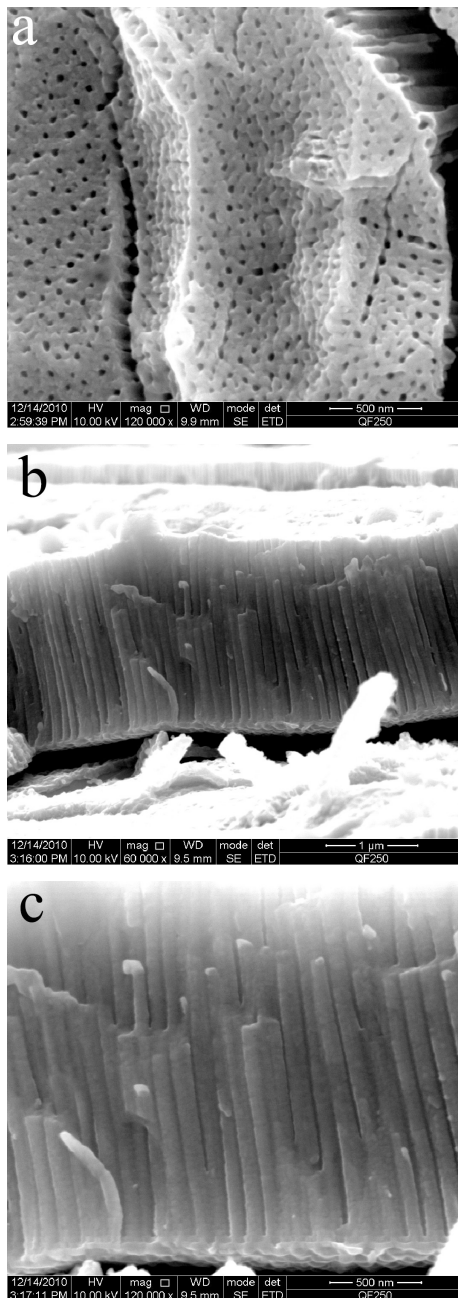


Fig. S5. Schematic diagrams (top-view images) of TiO₂ photoanode when rotated in an angle (α) of $-90^\circ \sim +90^\circ$. When the photoanode was normal to the incident light, the rotation angle was defined to be 0° . Positive and negative rotation angles were defined that the photoanode was rotated in a clockwise and counter-clockwise directions respectively.

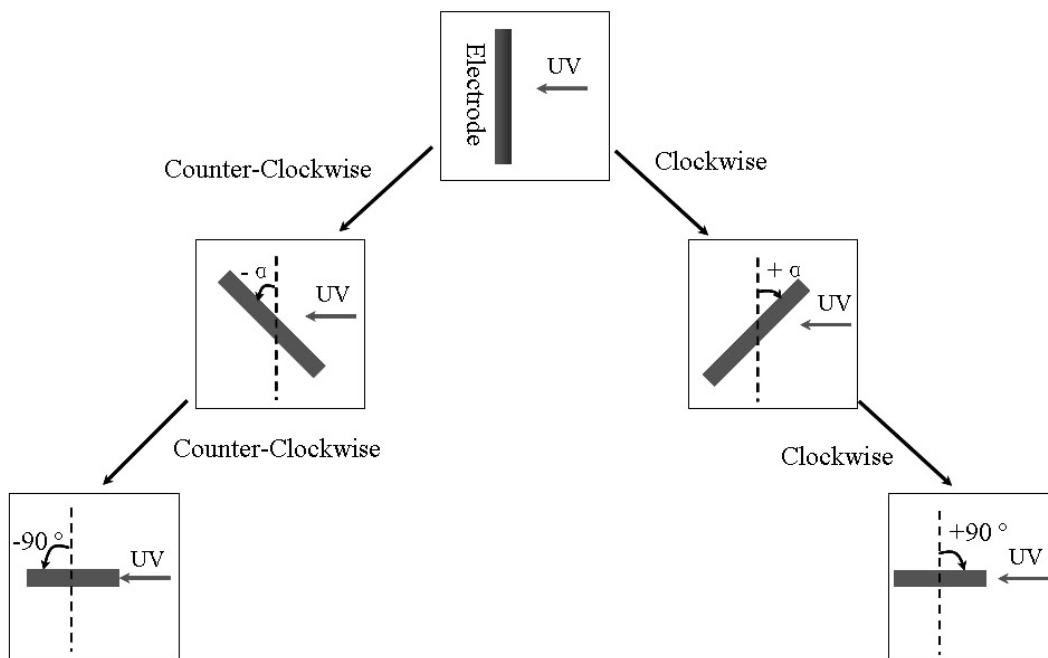


Fig. S6. Photocurrent density/potential curves of 2-D arrays of TiO₂ nanotubes with a length of 260 nm under rotation angle of 0 °, ±30 °, ±60 ° and ±90 °. Photocurrent density was measured under 10.5 mW/cm² UV irradiance.

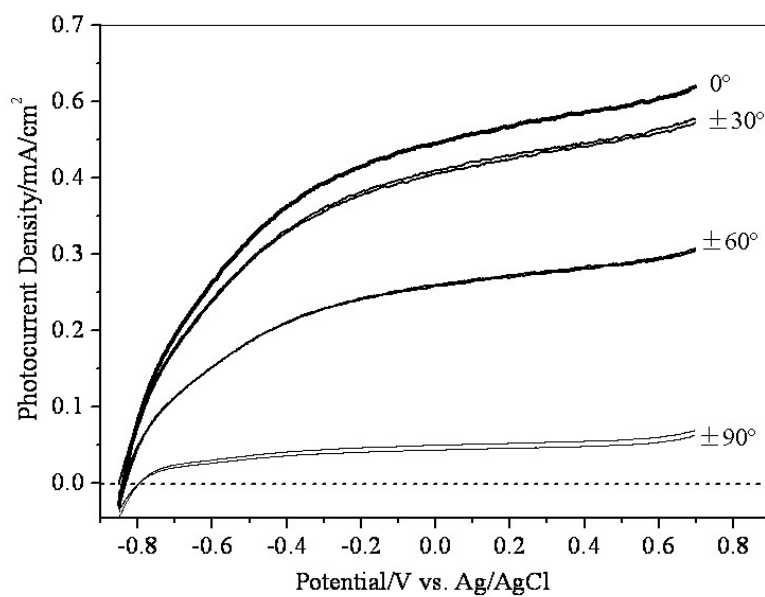


Fig. S7. Photocurrent density/potential curves of the 3-D arrays of TiO₂ nanotubes with a length of 260 nm in 1 M KOH electrolyte with (a) 5vol% and (b) 10vol% ethylene glycol additives under 10.5 mW/cm² UV irradiance.

