Electronic Supplementary Material (ESI) for Nanoscale

Supporting Information

Crystal Splitting and Enhanced Photocatalytic Behavior of Rutile TiO_2 Nano-belts Induced by Dislocations

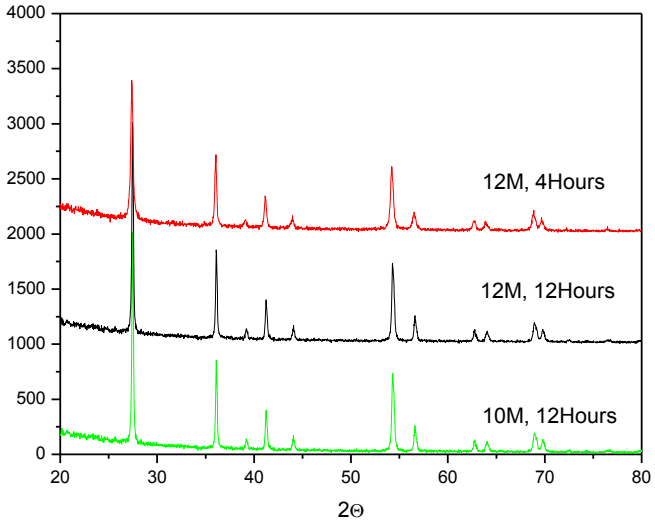

Figure S1. XRD analysis of TiO_2 nanostructures prepared with 10 M HCl and 12 M HCl. All peaks correspond to the rutile TiO_2 phase.

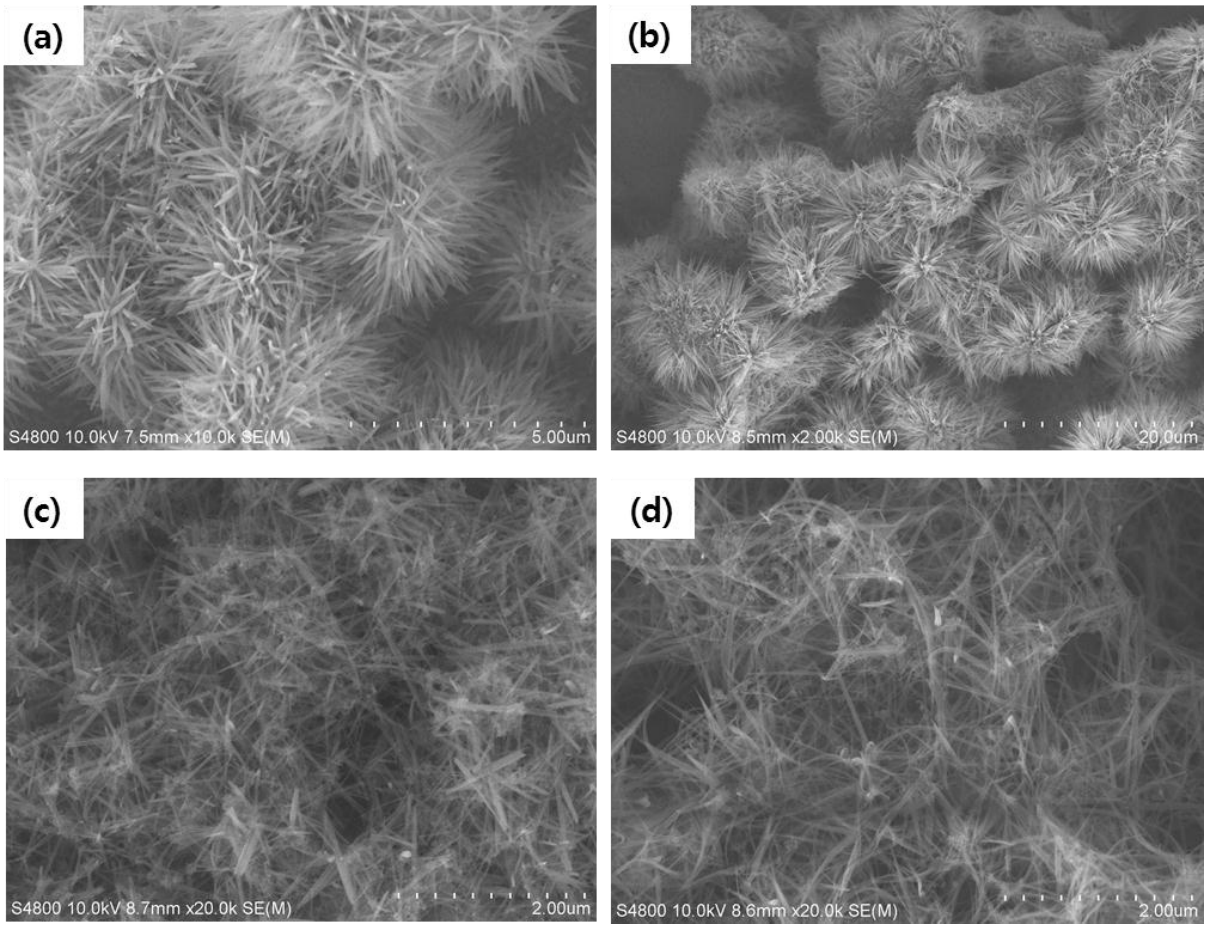

Figure S2. SEM micrographs of rutile TiO_2 nanostructures prepared by hydrothermal synthesis at 150℃ for (a) 2 h and (b) 8 h in 10 M HCl. (c) and (d) are TiO_2 nanostructures prepared by hydrothermal synthesis at 150℃ for 2 h and 8 h, respectively, in 12 M HCl.

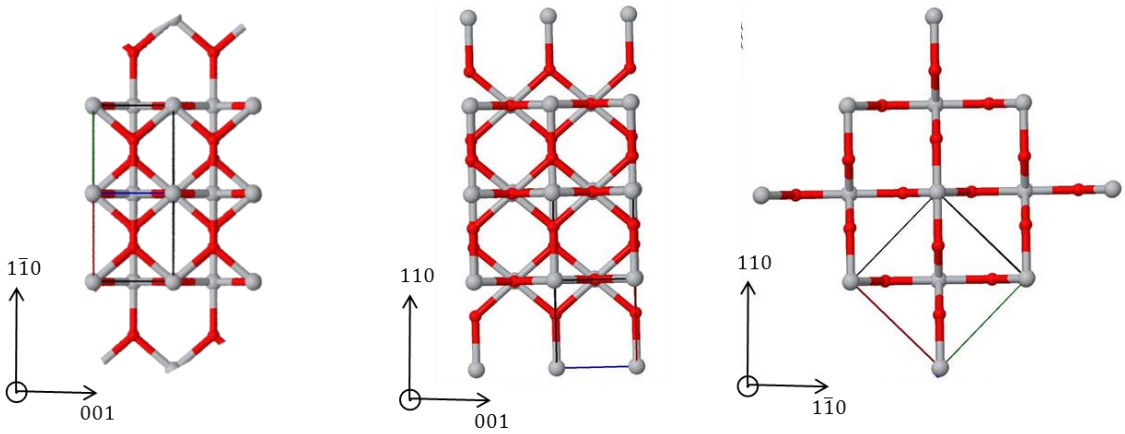

Figure S3. Crystal structure of rutile TiO_2 in three directions (from http://www.chemtube3d.com/solidstate/_rutile(final).htm).

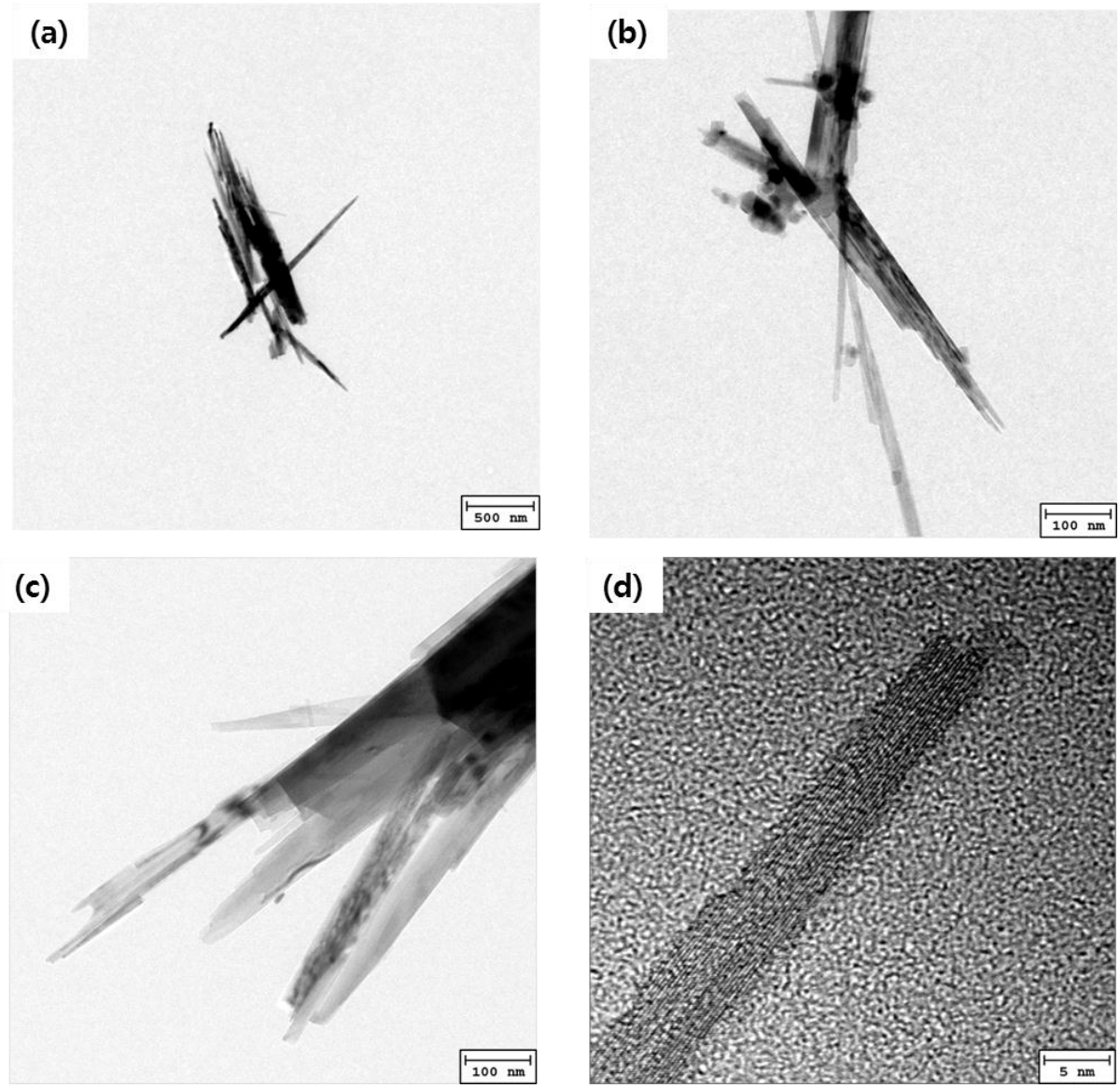

Figure S4. TEM micrographs showing splitting of a rutile TiO_2 nano-belt into thin nano-wires: (a) from 500 nm wide, (b) from 100 nm, and (c) from 200 nm. (d) a thin TiO_2 nano-wire about 5 nm wide.

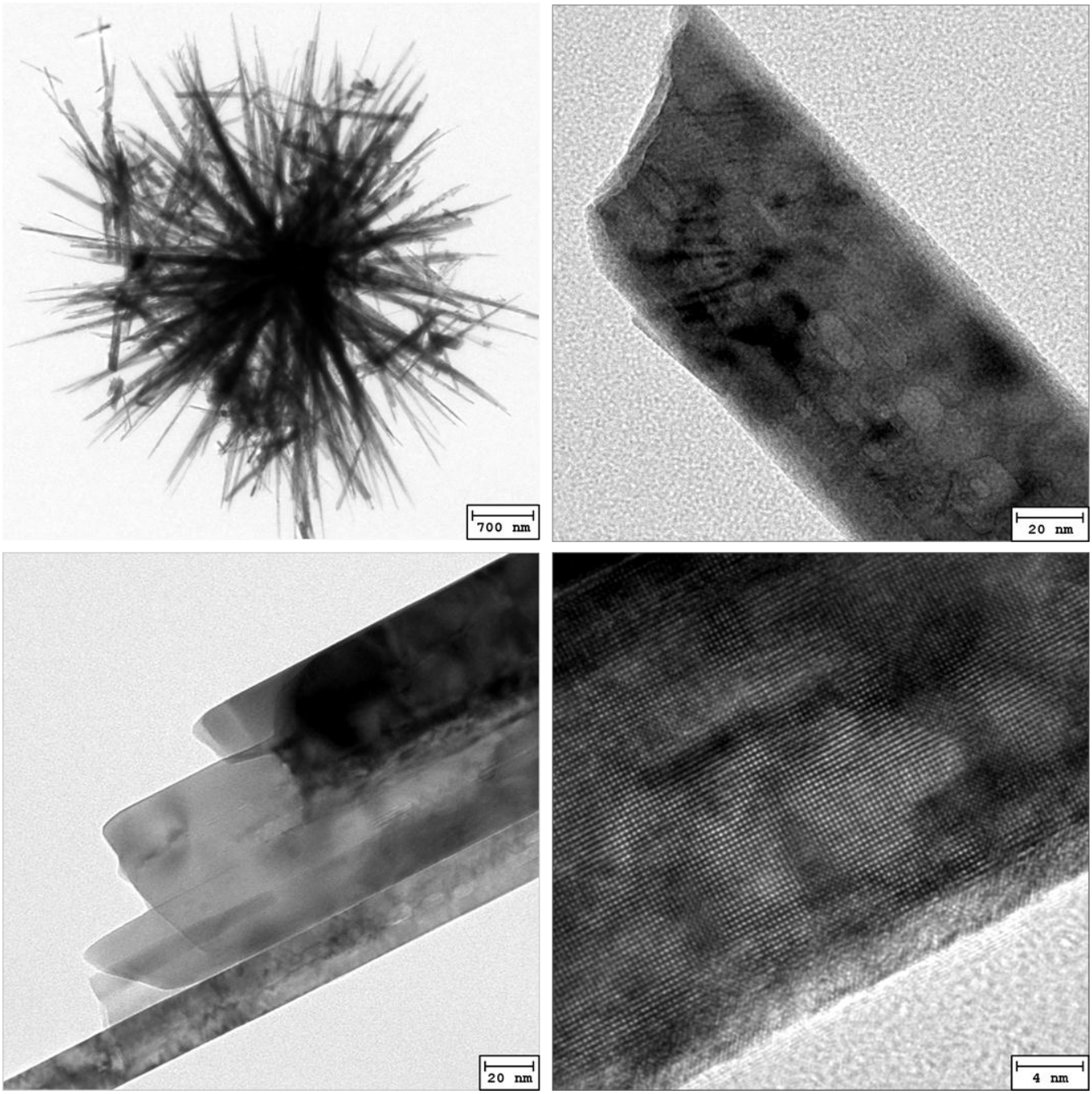

Figure S5. TEM micrographs of rutile TiO_2 nano-flowers prepared using 10 M HCl and titanium (IV) butoxide by hydrothermal synthesis at 150℃.

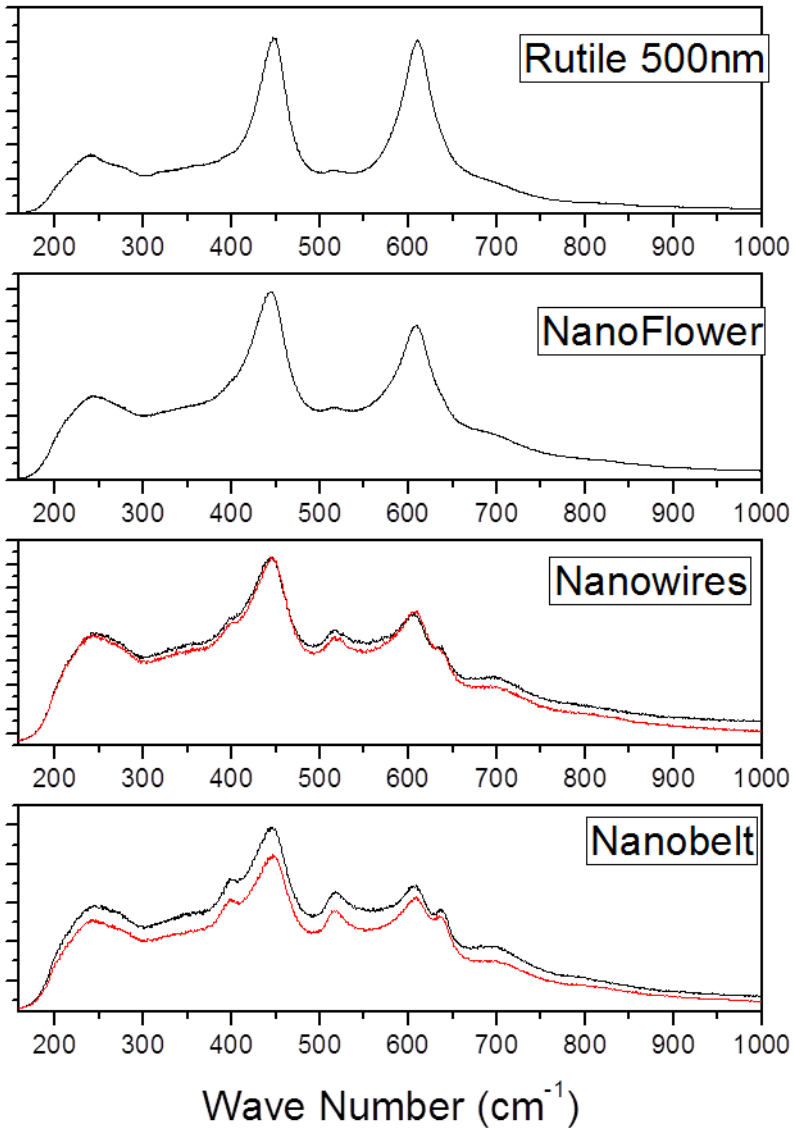

Figure S6. Raman spectra of rutile TiO_2 nanoparticles (500-nm-sized), nano-flowers, nano-wires, and nano-belts. The red lines in the spectra of nano-belts and nano-wires are for samples heat-treated at 450℃ for 2 h.