Supporting information

In-situ loading of ultra-small Cu_2O particles on TiO_2 nanosheets to enhance the visible-light photoactivity

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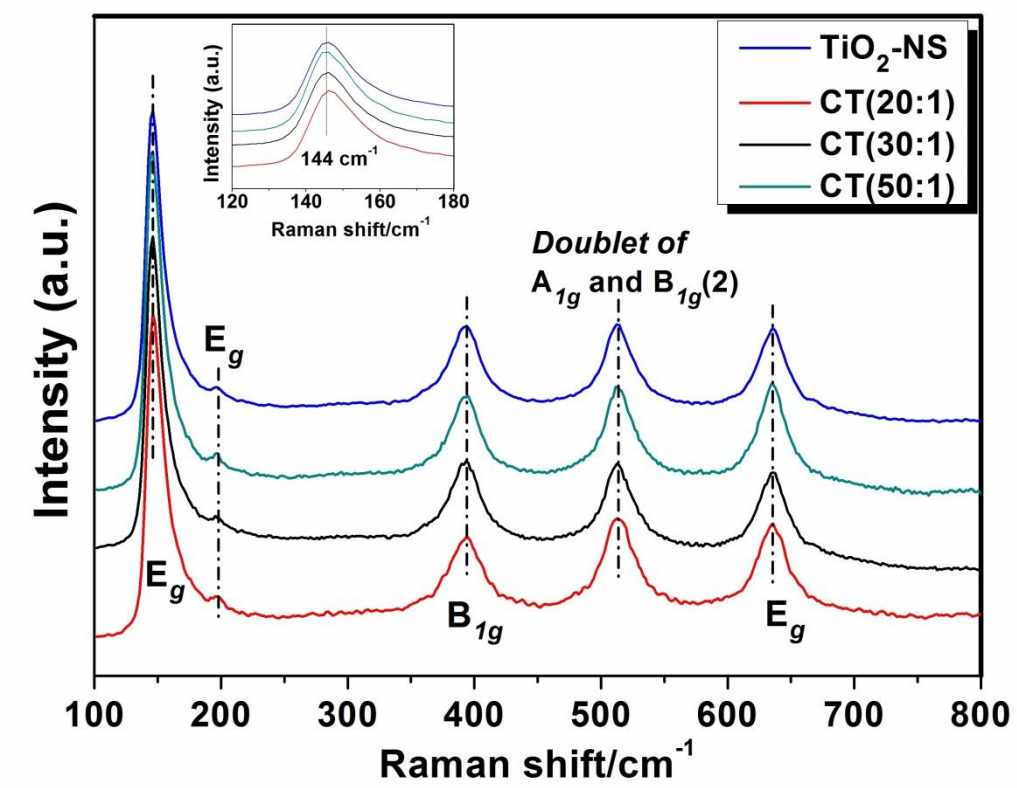

Fig. S1 Raman spectra of pure TiO_2 nanosheets (TiO_2-NS) and Cu_2O/TiO_2 nanosheets (CT nanosheets).

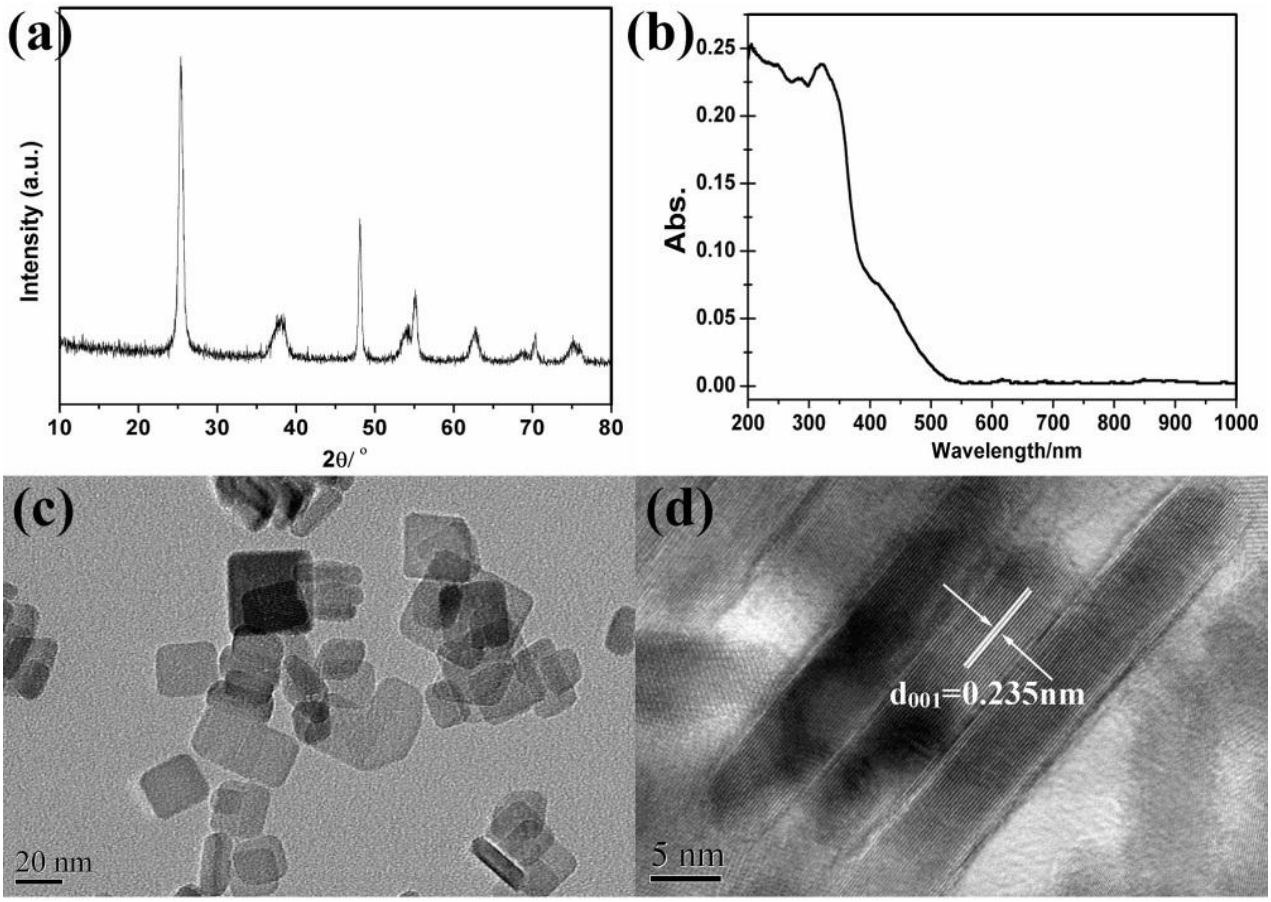

Fig. S2 Structural and morphological characterizations of N-doped TiO_2 nanosheets with {001} facets exposed. (a) XRD pattern, (b) UV-vis diffuse reflectance spectra, (c-d) TEM images.

The XRD pattern of N-doped TiO_2 nanosheets (N-TiO_2-NS) shows typical diffraction pattern of anatase (Fig.S2a), indicating they have the same crystal structure with TiO_2-NS and CT-NS. The UV-vis spectrum of N-TiO_2-NS is displayed in Fig. S2b. Obviously, the N-doped sample shows a enhanced absorption in 400~500 nm compared to pure TiO_2 nanosheets, which can be ascribed to the N-doping.

We use TEM to investigate the morphology of N-TiO_2-NS. In Fig. S2c, these N-doped TiO_2 nanosheets are rectangular nanosheets with side length of ca. 20~50 nm and thickness of ca. 4~10 nm. The HRTEM image Fig. S2d shows that the lattice spacing parallel to the top and bottom facets is ~0.235nm, corresponding to the {001} planes of anatase TiO_2. The morphology of N-TiO_2-NS is quite similar to that of TiO_2-NS and CT-NS, indicating that N-TiO_2-NS is a suitable visible-light catalyst for comparison to confirm the improvement in visible-light activity introduced by loading Cu_2O nanoparticles.