

Supporting Information

Valence State and Catalytic Role of Cobalt-Ions in Cobalt TiO₂ Nanoparticle Photocatalysts for Acetaldehyde Degradation under Visible Light

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Figure S1. Experimental set up for photocatalysis reaction.

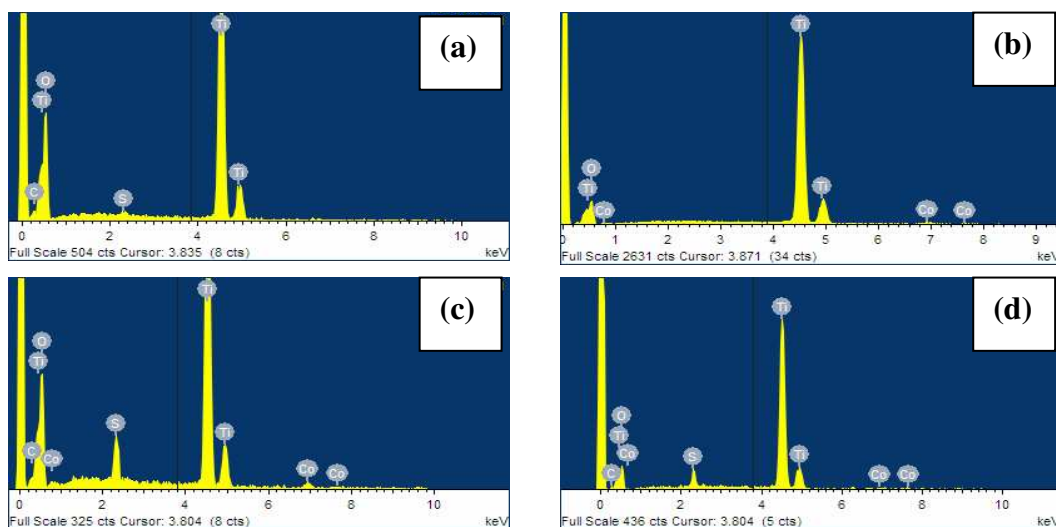


Figure S2. EDX spectra of (a) (C, S), (b) 2% Co(II)-TiO₂, (c) 2% Co(II)/(C, S)-TiO₂, and (d) 2% Co(III)/(C, S)-TiO₂.

Table S1. Amount of carbon and sulfur codoped with 2 at. % cobalt in TiO₂ samples after calcination in air at 500 °C for 2 h.

Sample	C (at. %)	S (at. %)
(C, S)-TiO ₂	4.2	0.2
2% Co(II)-TiO ₂	0	0
2% Co(II)/(C, S)-TiO ₂	4.1	2.1
2% Co(III)/(C, S)-TiO ₂	5.9	2.2

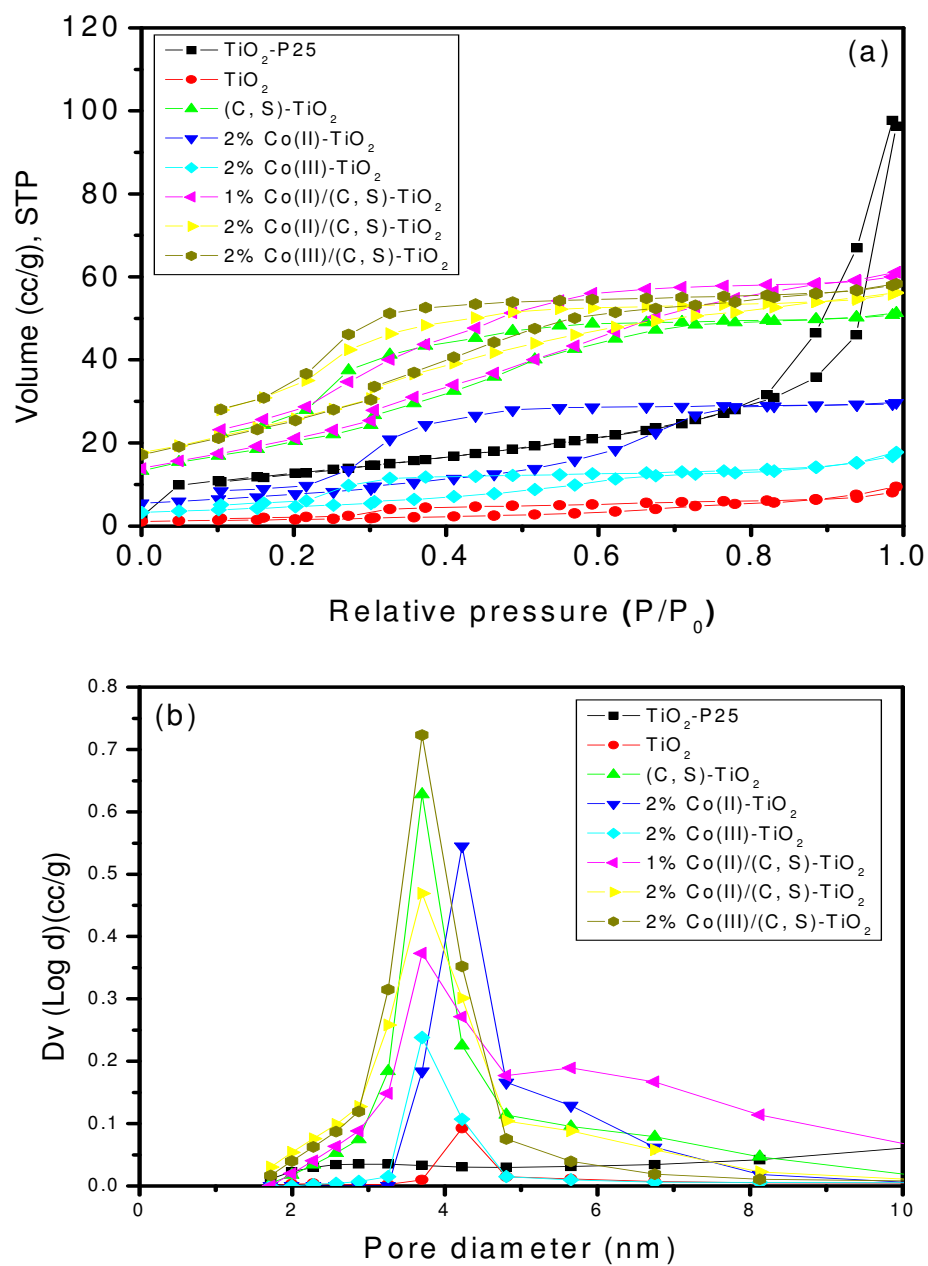


Figure S3. (a) N₂ adsorption-desorption isotherm and (b) pore-size distribution measured at 77 K.

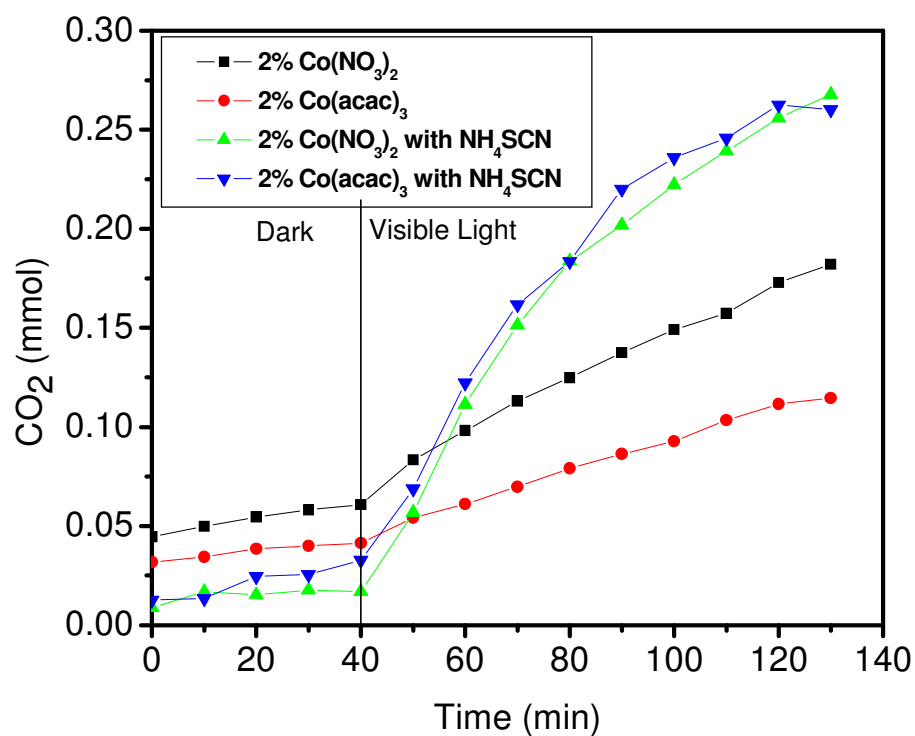


Figure S4. Effects of initial valence state of cobalt-ions with or without nonmetal precursor on CO₂ evolution from CH₃CHO photodegradation over the doped/codoped TiO₂ photocatalysts.