

Supplementary information

Photocatalytic hydrogenation of furan to tetrahydrofuran in alcoholic suspensions of metal-loaded titanium(IV) oxide without addition of hydrogen gas

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Adsorption of furan on TiO₂ or metal-loaded TiO₂

TiO₂ (MT-150A) or metal-loaded TiO₂ (200 mg) was suspended in 5 cm³ of methanol containing furan (40 ± 4 μmol) in a test tube. The test tube was sealed with a rubber septum under argon and the mixture was stirred in a water bath at 293 K for 18 hours in the dark. The amount of furan was determined with an FID-type gas chromatograph (GC-2025, Shimadzu) equipped with a DB-1 column. Chlorobenzene was used as an internal standard sample. Chlorobenzene (7 mm³) was added to the reaction solution (3 cm³). After the mixture had been stirred for 7 min, furan in the mixture solution was analyzed. The amount of furan was determined from the ratios of the peak areas to the peak area of chlorobenzene.

Catalytic hydrogenation of furan on TiO₂ or metal-loaded TiO₂ under H₂ in the dark

TiO₂ (MT-150A) or metal-loaded TiO₂ (50 mg) was suspended in 5 cm³ of methanol in a test tube. The test tube was sealed with a rubber septum under H₂ and injected methanol (500 μmol) containing furan (40 ± 4 μmol). The mixture was stirred in a water bath at 293 K for 5 min in the dark. The amount of THF was determined with an FID-type gas chromatograph (GC-2025, Shimadzu) equipped with a DB-1 column. Chlorobenzene was used as an internal standard sample. Chlorobenzene (7 mm³) was added to the reaction solution (3 cm³). After the mixture had been stirred for 7 min, furan in the mixture solution was analyzed. The amount of THF was determined from the ratios of the peak areas to the peak area of chlorobenzene.

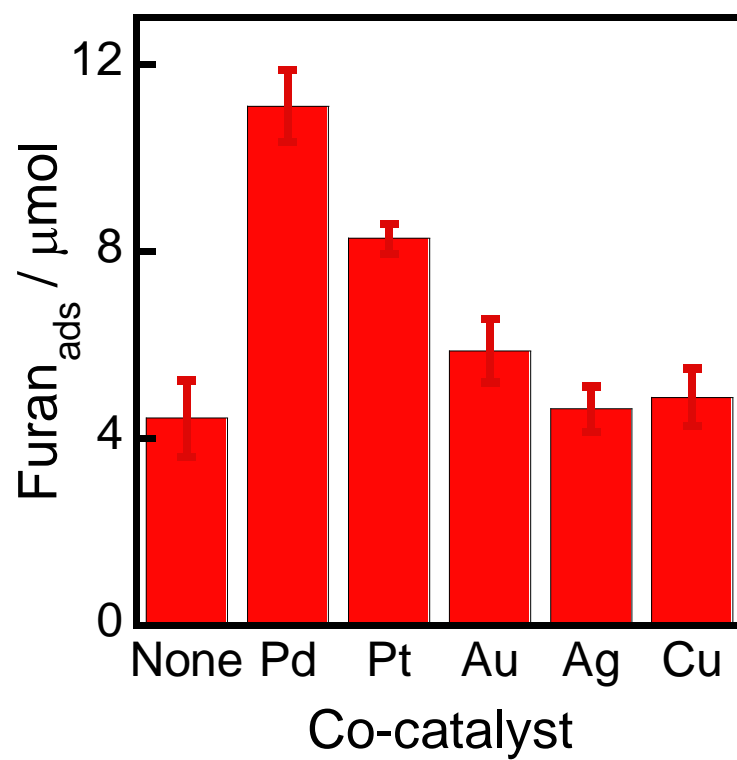


Figure S1 Effects of different kinds of photocatalysts (each 200 mg) on amount of furan adsorbed in methanolic suspensions for 18 h in the dark.