

Supporting information

Doping of ZnO into CuO phase by sonochemical approach improves the CuO-ZnO/TiO₂ catalyst for WGS reaction

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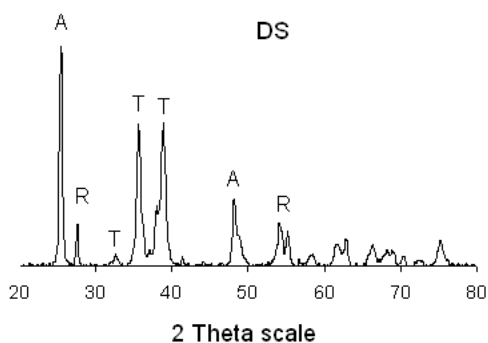


Figure SI-1. XRD patterns of the CuO-ZnO/TiO₂ catalyst prepared by sonochemical method with the commercial titania (A – TiO₂ anatase, R - TiO₂ rutile, T - CuO tenorite).

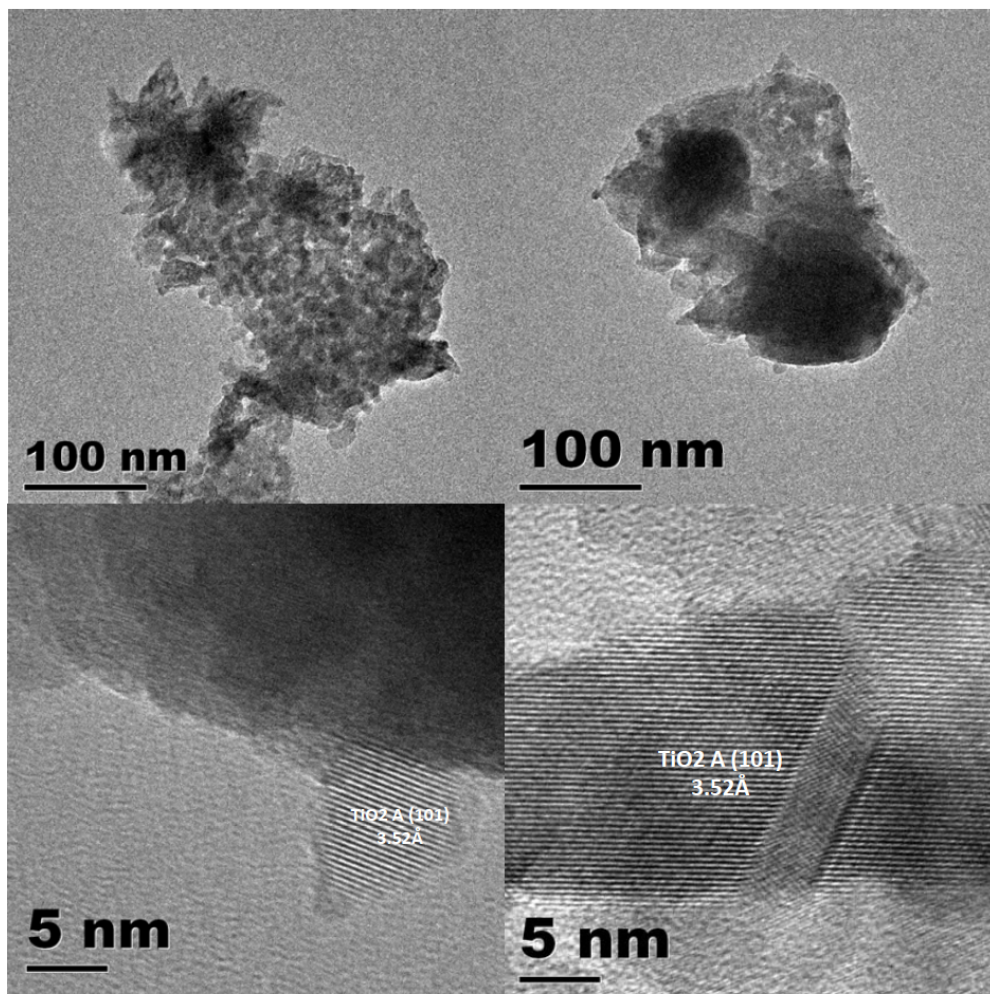


Figure SI-2. HRTEM images of the S500 catalyst reduced in H₂ at 350°C. Some rod-like structures were developed after the H₂-reduction. After checking various areas, it is determined that these rod-like structures are anatase (TiO₂ A). The interplanar spacings are referred to the following JCPDS cards:

TiO₂ Anatase (101) : 0.352 nm; TiO₂ Anatase (004) : 0.238 nm (JCPDS no. 00-021-1272)

TiO₂ Rutile (110) : 0.322 nm (JCPDS no. 00-021-1276)

CuO Tenorite (110): 0.275 nm; CuO Tenorite (002): 0.253 nm ; CuO Tenorite (202): 0.186 nm (JCPDS no. 00-041-0254).

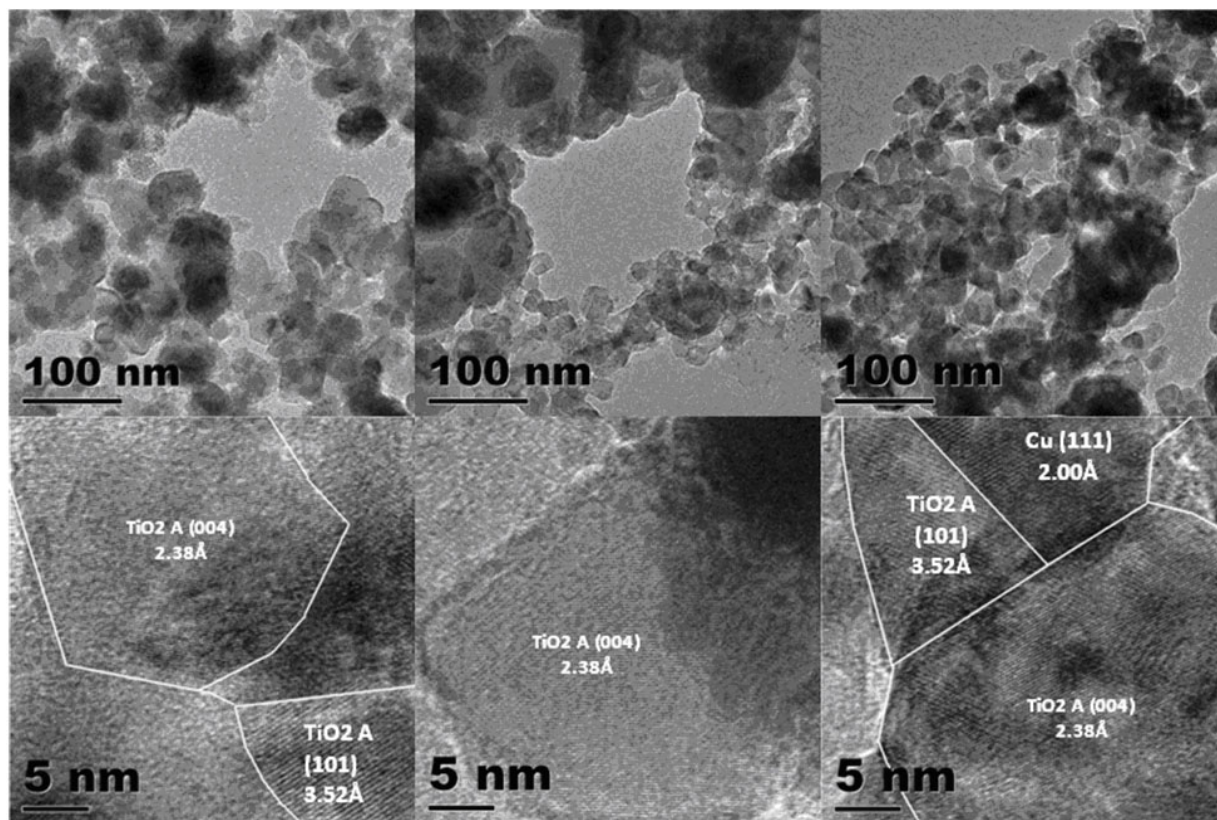


Figure SI-3. TEM images of the DS catalyst reduced in H_2 at 350°C . There was no obvious change in structure and morphology, indicating the support and catalyst are stable in structure.

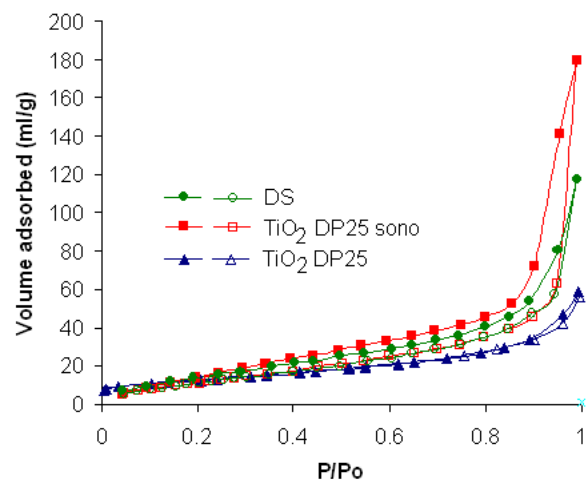


Figure SI-4. Adsorption-desorption isotherms of CuO-ZnO/TiO₂ prepared sonochemically with commercial TiO₂ P25(Degussa).

Table SI-1 Surface characteristics for the catalysts S500.

Catalyst	Conditions of experiment	Surface area (m ² /g)	Pore volume (cc/g)	Pore size (Å)
S500	As prepared	47	0.12	60
	After reaction	46	0.11	114
	90h stability test	62	0.09	90