Supplementary material

Synthesis of synergetic internal Fe^{3+} doped and superficial Pt loaded WO_3 nanostructures with high photocatalytic activity and stability for ethylene degradation under visible light irradiation

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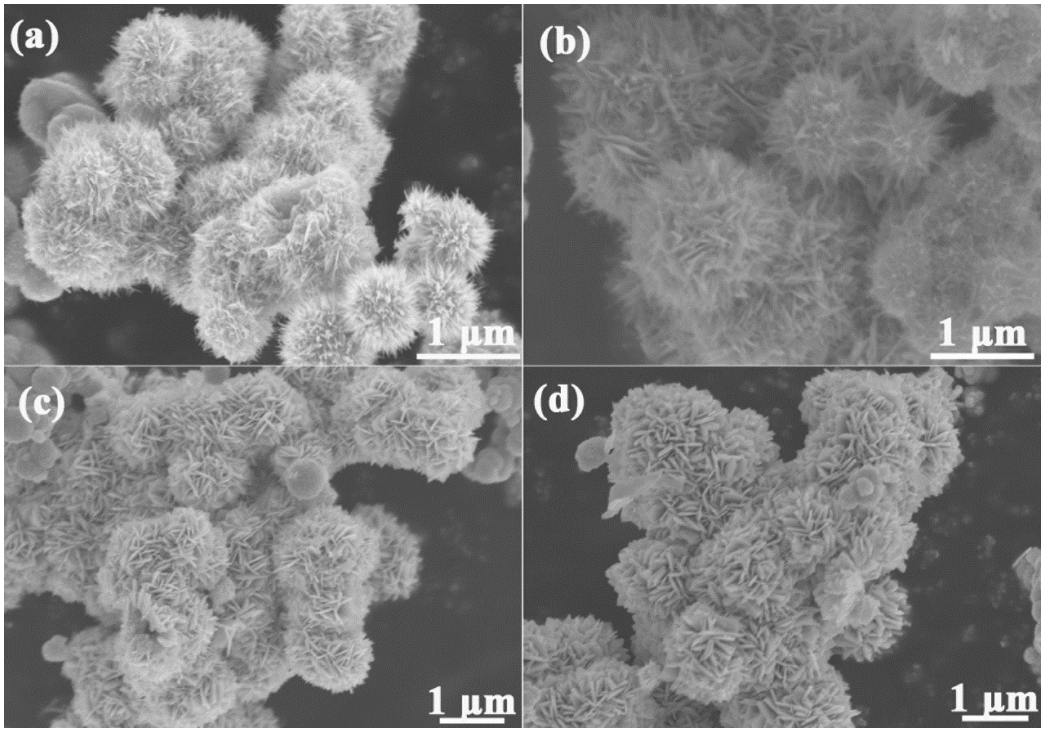

Fig. S1. SEM image of the as-synthesized urchin-like $WO_{2.72}$ architectures calcined at (a) 350 ℃, (b) 400 ℃, (c) 450 ℃, (d) 500 ℃.

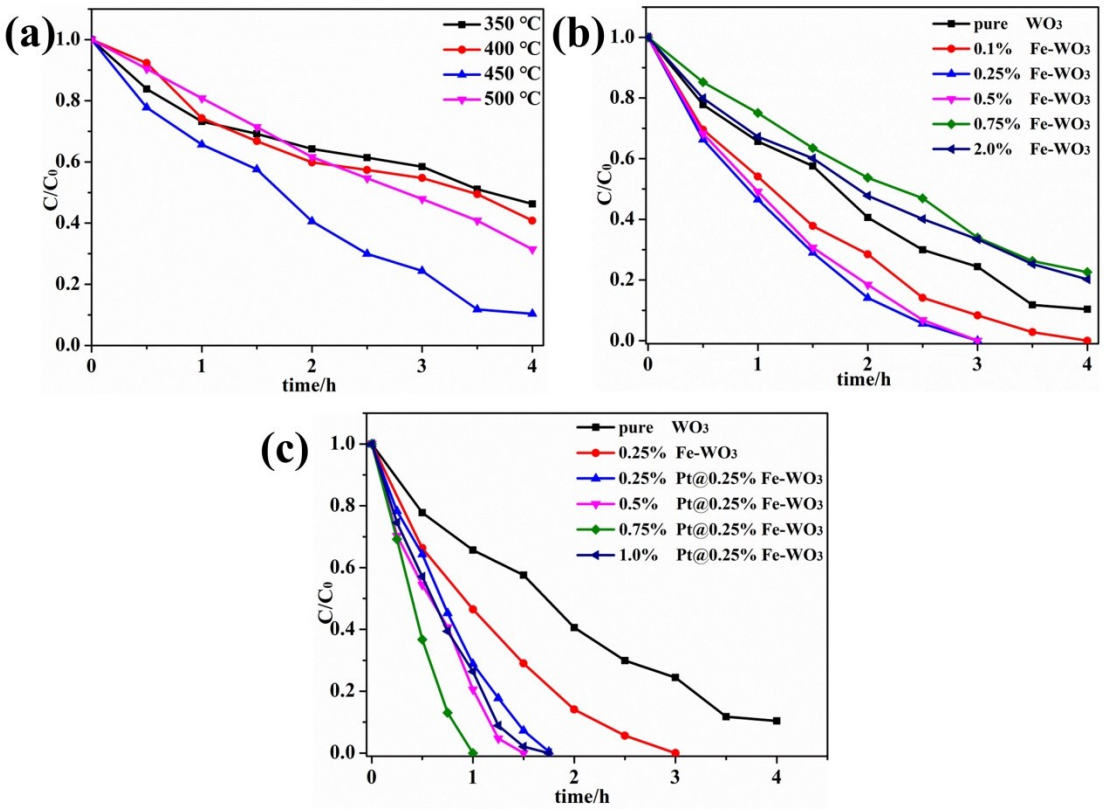

Fig. S2. Photocatalytic degradation of ethylene by (a) pure WO_3 under different temperature, (b) WO_3 doped with different amounts of Fe and (c) 0.25 mol% Fe-WO_3 with different amount of Pt under the irradiation of full spectrum light.

Table S1 The comparison of photocatalytic C_2H_4 degradation activity of different photocatalysts.

photocatalyst	concentration of C_2H_4 (ppm)	amount of catalyst (g)	light source	performance	reference
0.75 wt% Pt@0.25 mol% Fe-WO_3	1250	0.4	300 W Xe lamp (visible light, λ> 420 nm)	after 4 h light irradiation, it can be degrade completely	**This work**
0.75 wt% Pt@0.25 mol% Fe-WO_3	1250	0.4	300 W Xe lamp full spectrum irradiation	after 1 h light irradiation, it can be degrade completely	**This work**
$BiVO_4$/P25	1500	1	500 W Xe lamp (visible light, λ> 400 nm)	after 6 h light irradiation, only 7.56% C_2H_4 is degraded	[1]
In_2O_3-Ag-Ag_3PO_4	200	0.2	300 W Xe lamp (visible light, λ> 420 nm)	after 2 h light irradiation, it can be degrade completely	[2]
Pt-TiO_2 nanosheets	200	0.1	300 W Xe lamp (visible light, λ> 420 nm)	after 12 min light irradiation, it can be degrade completely	[3]
AuAg/ZnO	1250	0.12	300 W Xe lamp full spectrum irradiation	after 1 h light irradiation, it can be degrade completely	[4]
Ag/ZnO	2500	0.5	300 W Xe lamp full spectrum irradiation	after 2.5 h light irradiation, it can be degrade completely	[5]

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