Electronic supplementary information

Photo-reduction assisted synthesis of W-doped TiO_2 coupled with Au nanoparticles for highly efficient photocatalytic hydrogen evolution

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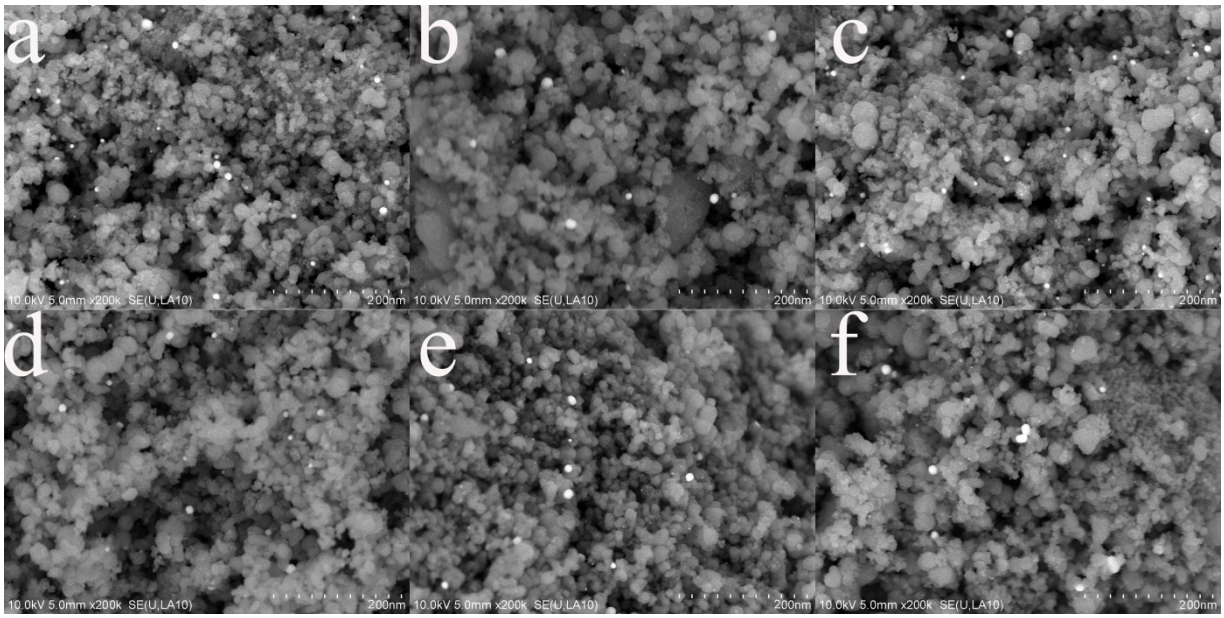

Fig. S1 (a-f) FE-SEM images of the as-prepared W-TiO_2/Au hybrids.

Elemental analysis：

Table S1 Elemental analysis of all the as-prepared samples

Samples	Weight (g)	Weight percent (%)	
		Au	W
Sample A	0.0192	0.96	0.70
Sample B	0.0203	1.15	0.76
Sample C	0.0202	1.37	0.78
Sample D	0.0202	1.93	0.83
Sample E	0.0207	1.94	0.97
Sample F	0.0206	2.90	1.03
*W-TiO_2	0.0205	0	0.71
*TiO_2/Au	0.0209	0.95	0

$H_4SiW_{12}O_{40}$ (HSiW) used in our experiment serves as the reducing and capping agent for $HAuCl_4$. First, HSiW was reduced to heteropoly blue by isopropanol (IPA) under mercury lamp irradiation. Then the $HAuCl_4$ was reduced by the as-formed heteropoly blue to form Au nanoparticles (NPs) and simultaneously $SiW_{12}O_{40}^{4-}$ coated on the surface of Au NPs, thus hindering the further growth of Au crystals. Similar work has been reported in literature (S. Mandal, P. R. Selvakannan, R. Pasricha and M. Sastry, J. Am. Chem. Soc., 2003, **125**, 8440.). The more the $HAuCl_4$ was used, the more Au NPs were generated, thus leading to more HSiW adsorbed on the surface of as-formed Au NPs. The un-adsorbed HSiW is easily washed away during the process of centrifugating and cleaning. So, the amount of W doped TiO_2 increased with amount of $HAuCl_4$ added.