

Supplementary Information

TiO₂ surfaces self-doped with Ag nanoparticles exhibit efficient CO₂ photoreduction under visible light

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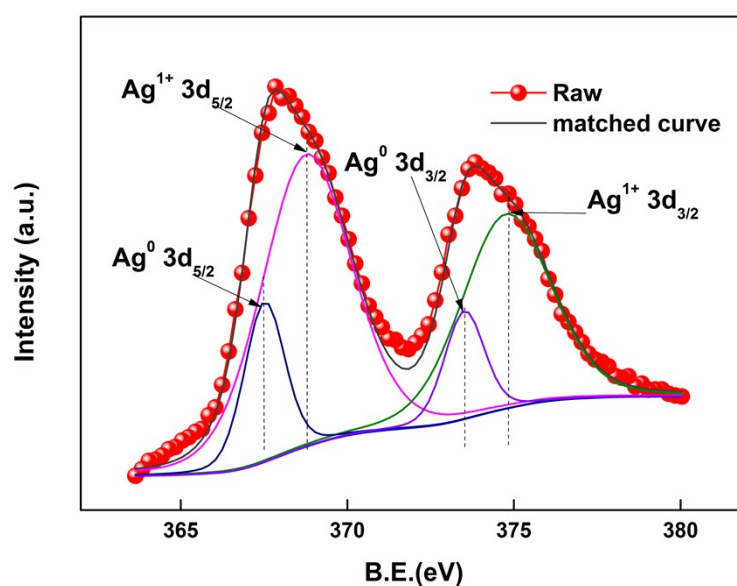


Figure S1. XPS spectrum of AC

This sample was loaded by Ag₂O and treated with ethanol. However, it was not treated by DBD plasma and labeled as “AC”. The Ag high resolution XPS of AC shows that there were two kinds of Ag in this sample namely Ag⁰ and Ag⁺, which means that the ethanol treatment can reduce the Ag₂O partly.

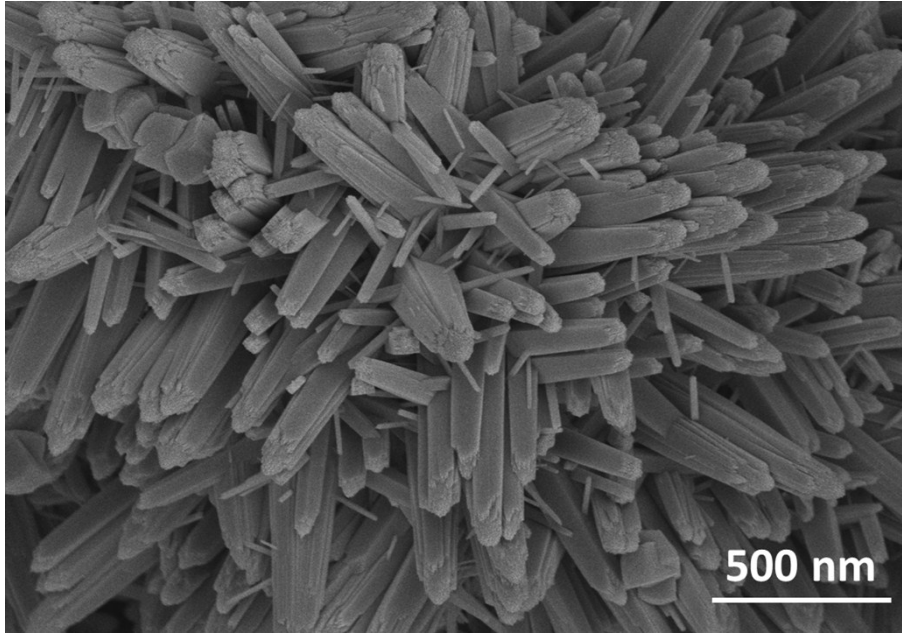


Figure S2 the SEM image of pristine TiO₂ film

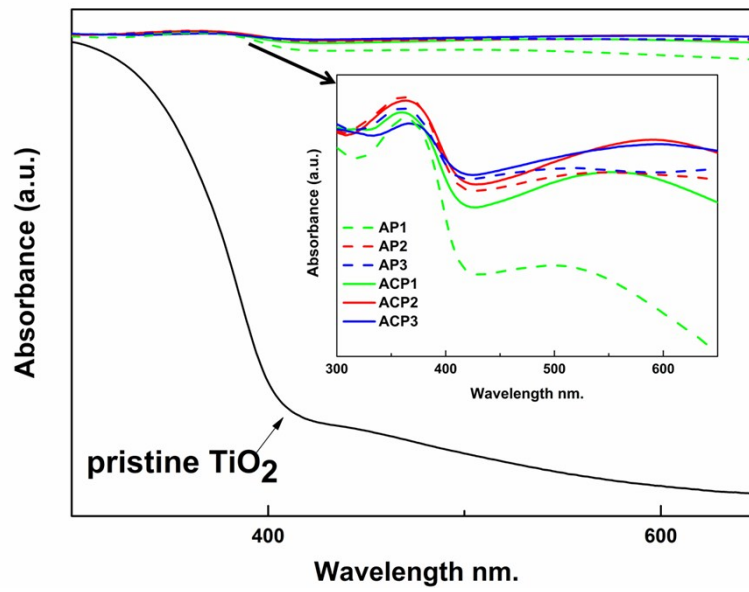


Figure S3 The UV-vis diffuse reflectance spectra of the pristine TiO₂, AP and ACP samples. The inset picture is detailed spectra of AP and ACP samples.

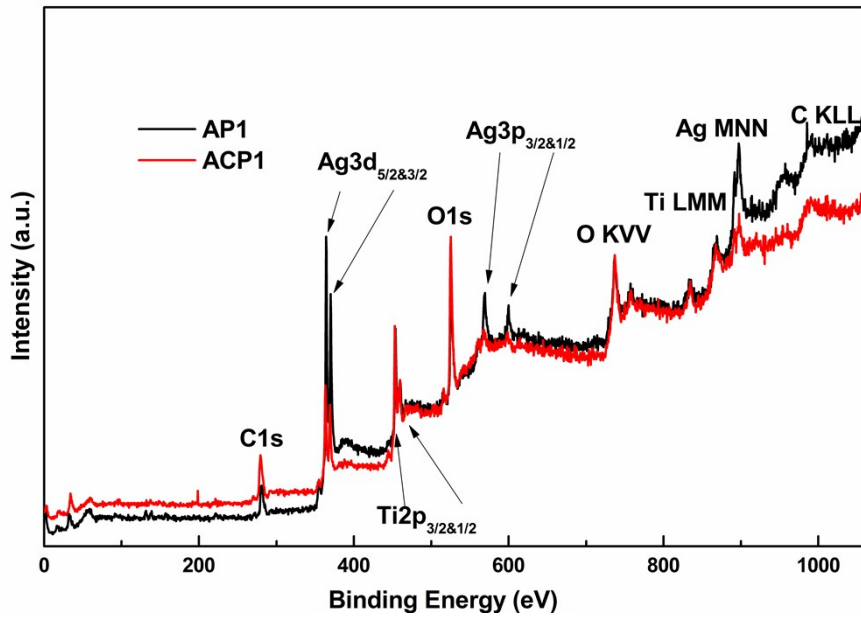


Figure S4. XPS spectra of AP1 and ACP1.

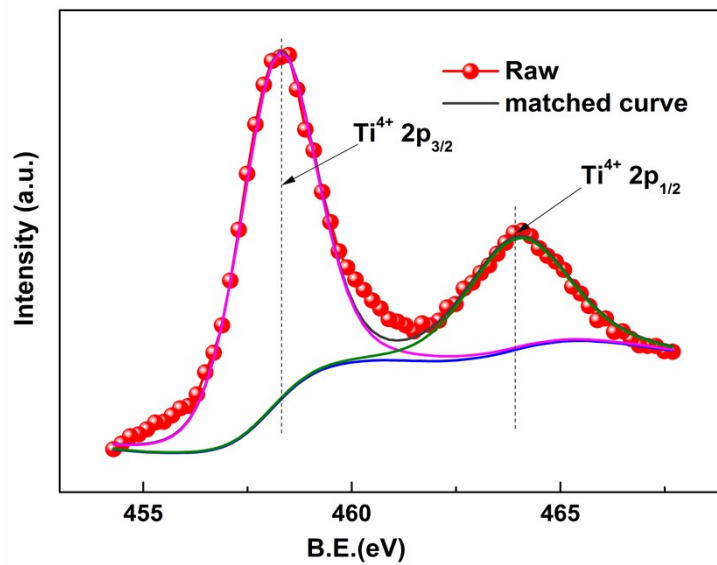


Figure S5. The Ti high resolution XPS spectra of samples CAP

In order to identify the AgNPs' effect on the stabilization of the surface intrinsic defects, an experiment employed a sample that was treated by ethanol and loading AgNPs with different order was conducted. A pristine rutile TiO₂ film was treated

firstly by ethanol and then loaded by AgNPs by chemical perception method and DBD plasma. It was labeled as "CAP". In the Ti high resolution XPS of CAP, there were only peaks attributed to the Ti^{4+} without shoulder peaks can be attributed to the intrinsic defects (Ti^{3+}). This result means that the intrinsic defects do not exist in the surface of CAP.