Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Photoinduced Fermi-level Shift, Electron Separation, and Plasmon Resonance Change of the Ag/TiO_2 photocatalyst under Gaseous Conditions

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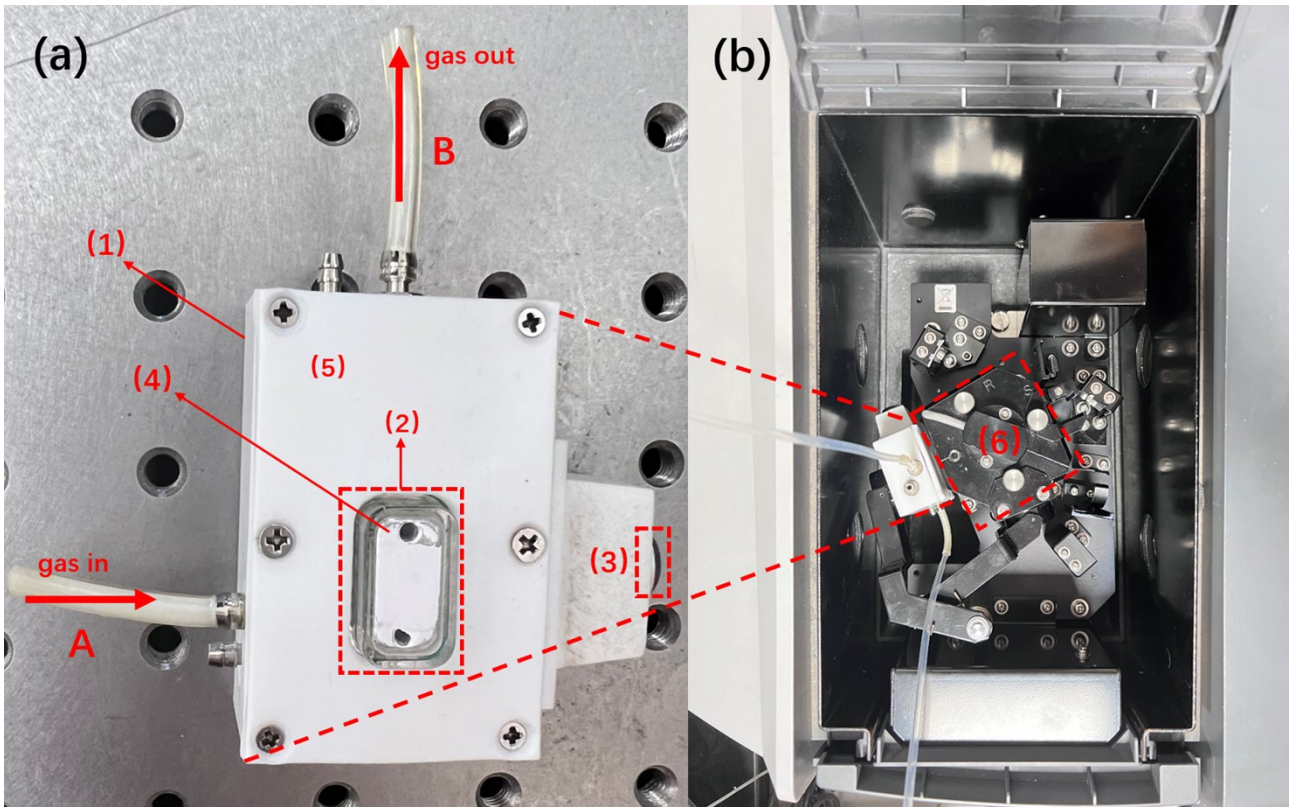

Fig. S1 (a) Digital picture of the sample stage; (b) Digital picture of the sample stage equipped in a Shimadzu optical integration sphere. The sample stage consists of the base (1) and a sample cell (2). The heating element is in the sample stage, which is connected to a temperature control system through interface (3). The sample cell is cover with a small transparent quartz cup (4) to form a closed chamber. Atmosphere gas can flow into the chamber from inlet A, which flows through enclosed sample cell, and flow out through the outlet B. For measurement, the sample powder was firstly pressed into the sample cell (2), which was then over with the quartz cup (4), and then was fixed with the PTFE cover (5). The size of the transparent quartz cup that covered the sample can be inserted into the integration optical sphere (6), as shown in Fig. S1(b). During the measurement, the temperature of the sample stage wa heated and controlled by a temperature controller through the interface (3). The atmosphere gas was controlled by a glass rotameter to slowly flow through the enclosed sample.

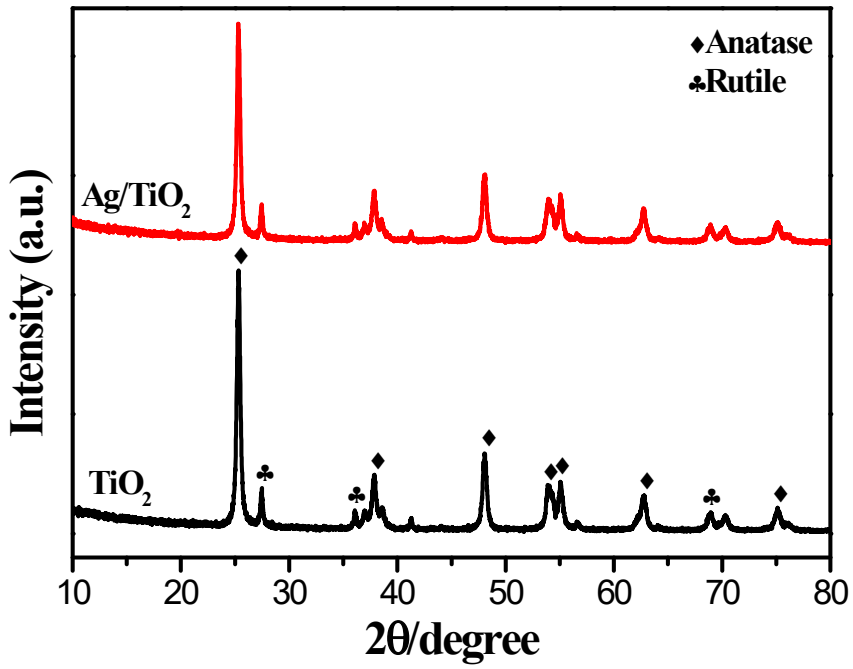

Fig. S2 XRD patterns of the undecorated TiO_2 and Ag/TiO_2 samples

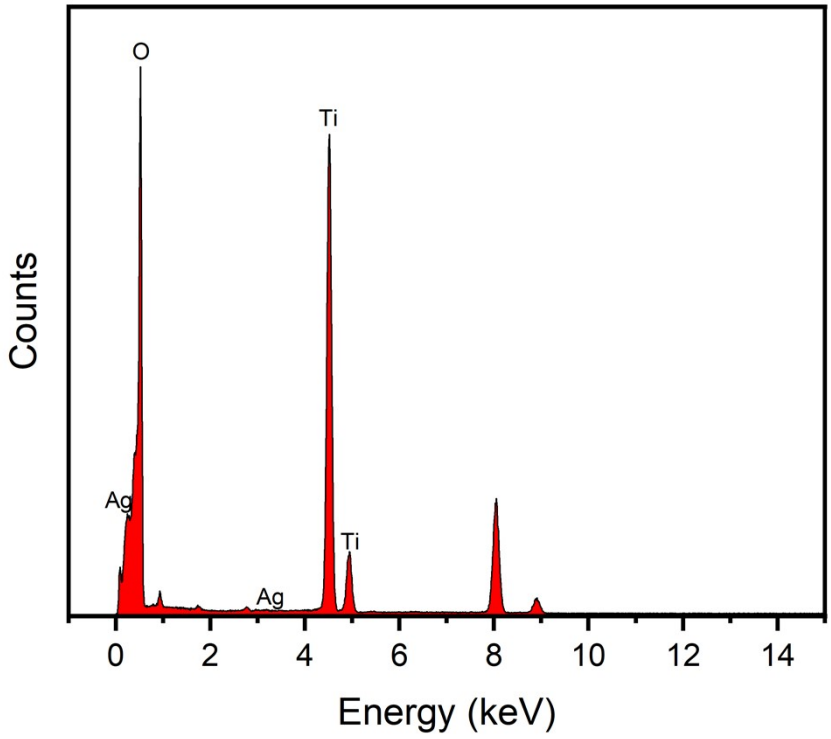

Fig. S3. EDX element analysis of the Ag/TiO2

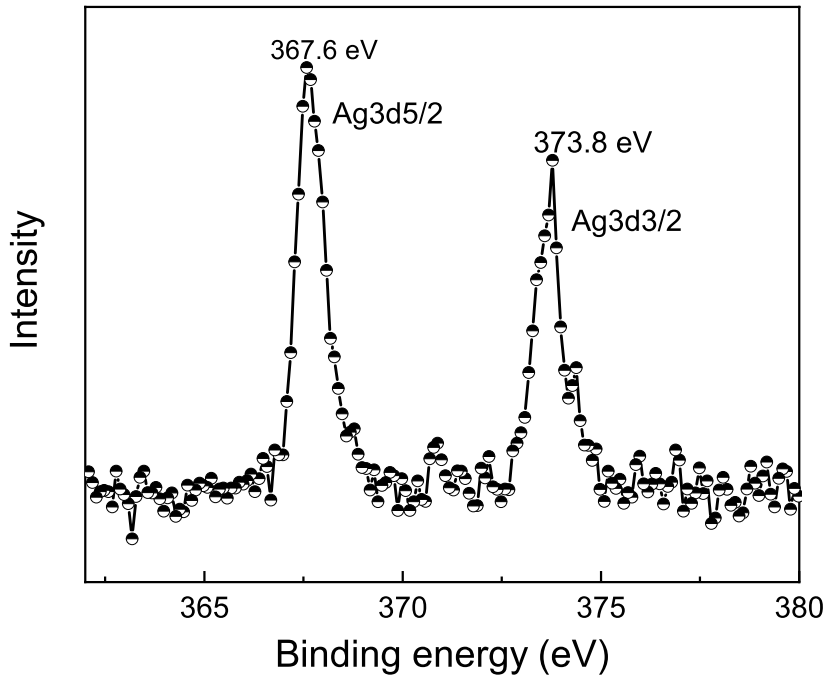

Fig. S4 Ag3d high-resolution XPS spectrum of L-Ag/TiO2

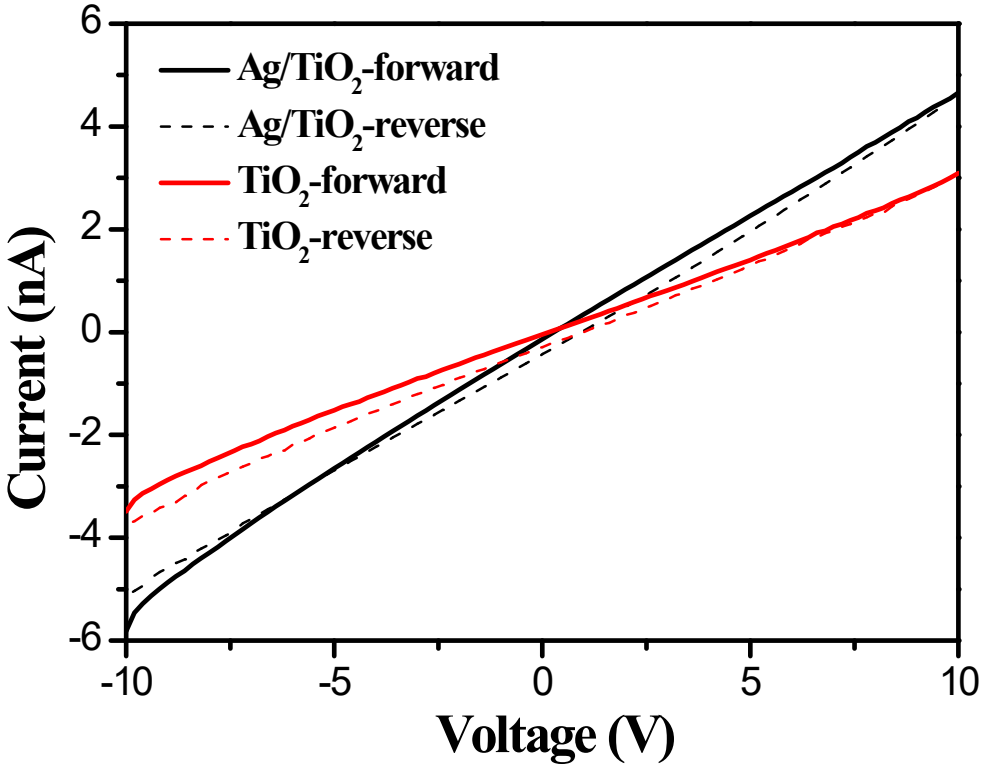

Fig. S5 V-I curves of the pristine TiO_2 and L-Ag/TiO_2

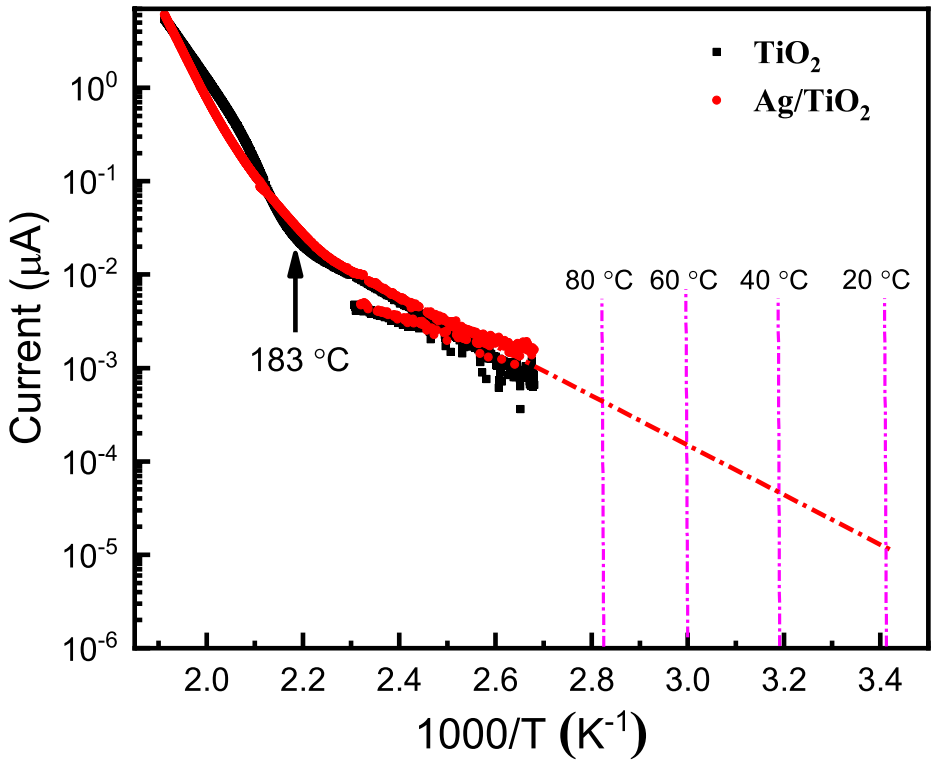

Fig. S6 Temperature-dependent dark currents of the TiO_2 and Ag/TiO_2

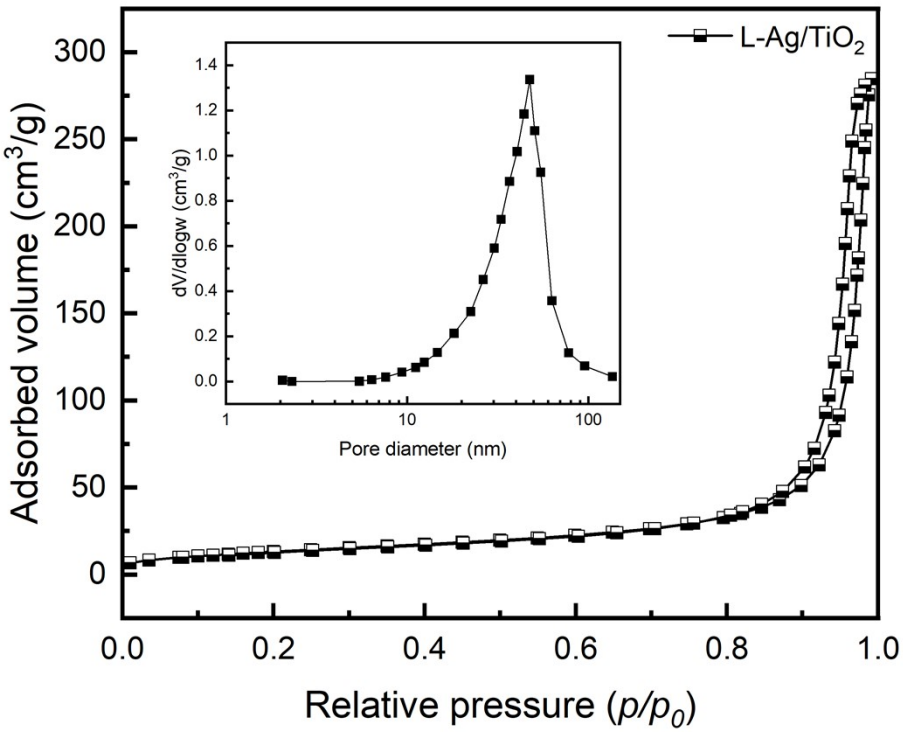

Fig. S7. BET isotherm N_2 sorption curves of the Ag/TiO_2 (inset show the pore distribution)

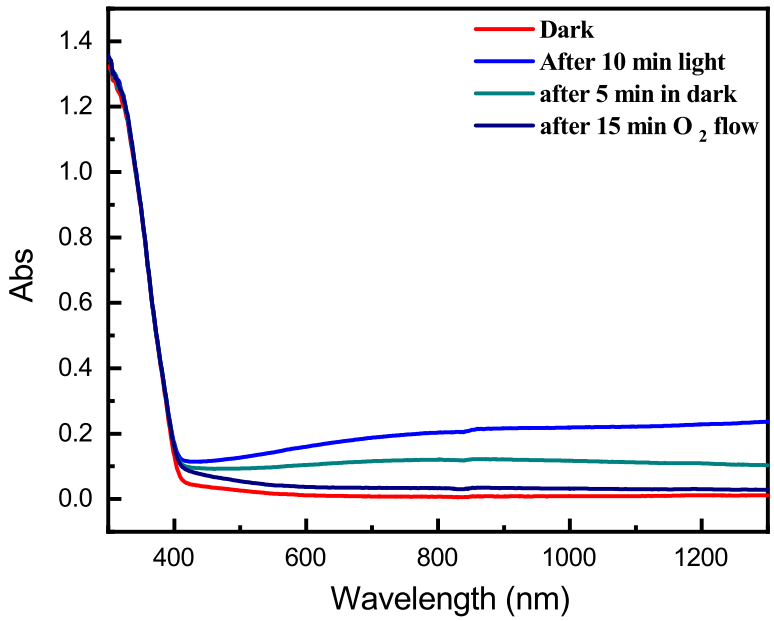

Fig. S8 Absorption spectra of the pristine TiO_2 before and after 375 nm laser irradiation in methanol contained N2 atmosphere under different conditions;