Supporting Information (SI)

Cd-doped $Ag_2O/BiVO_4$ visible light Z-scheme photocatalyst for efficient ciprofloxacin degradation

by

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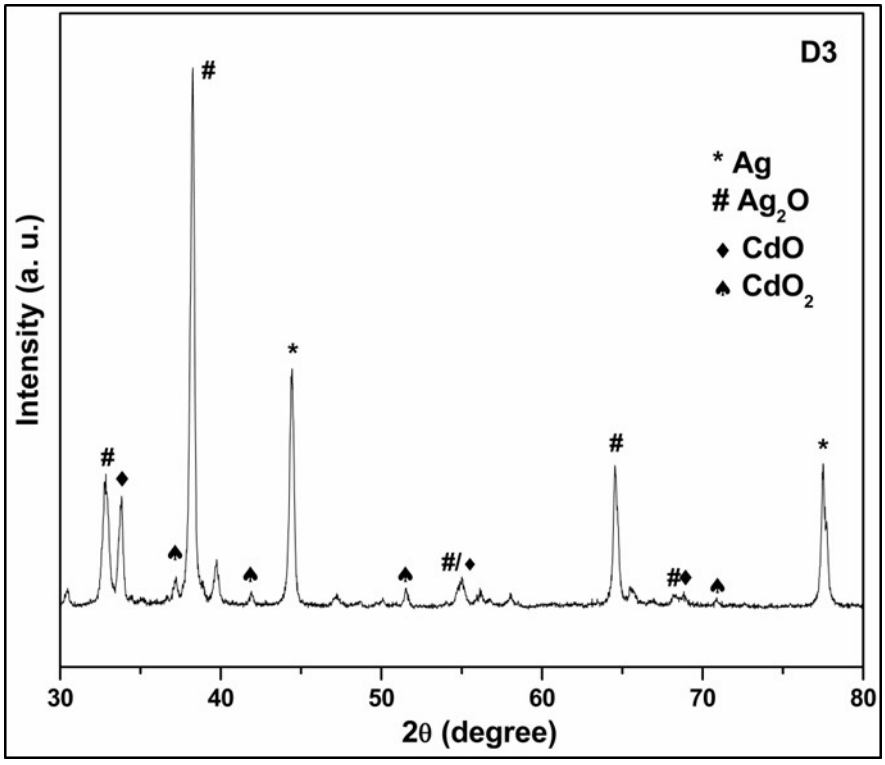

Figure S1. Powder XRD pattern of D3 sample.

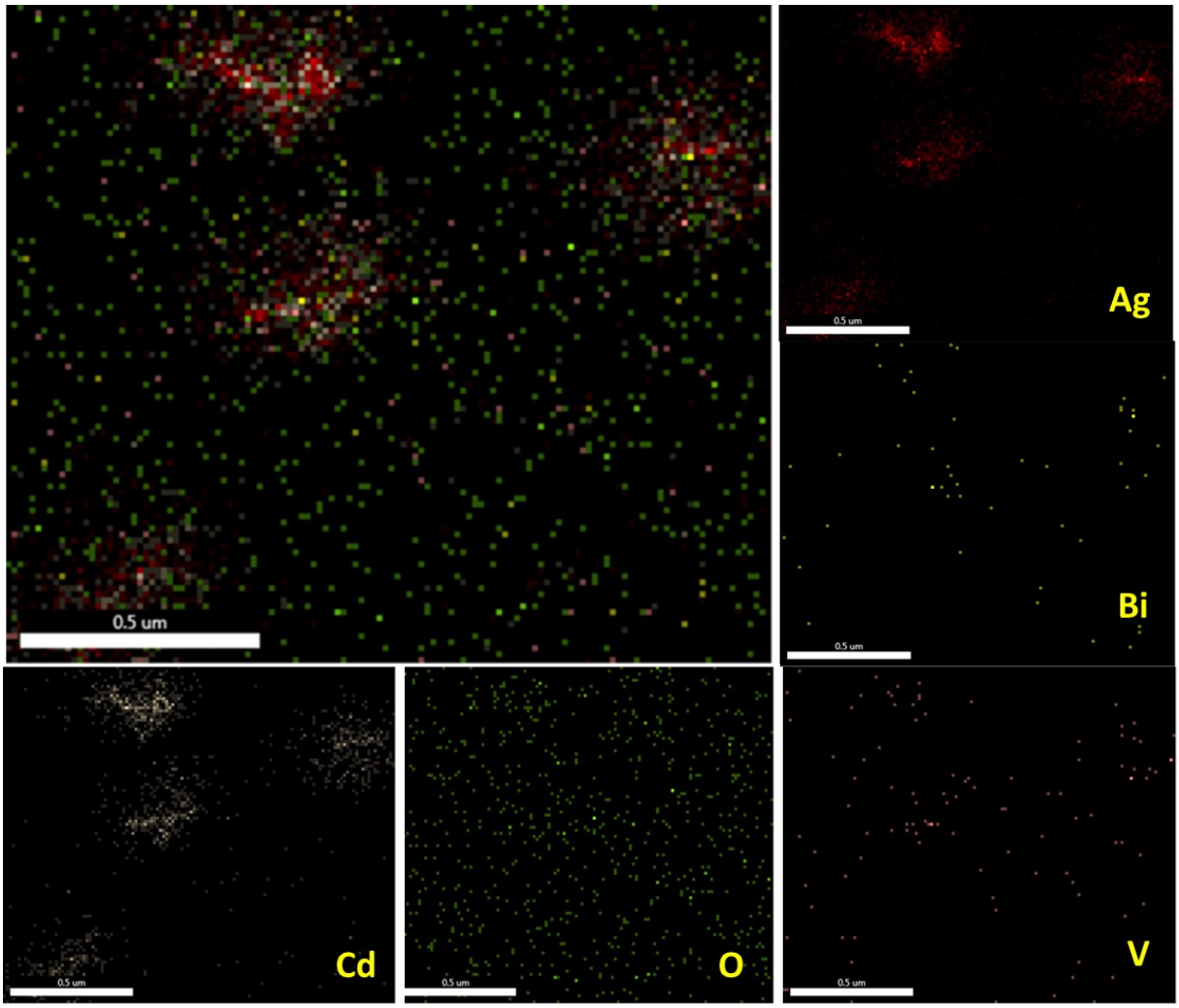

Figure S2. Elemental mapping of D1/10V sample.

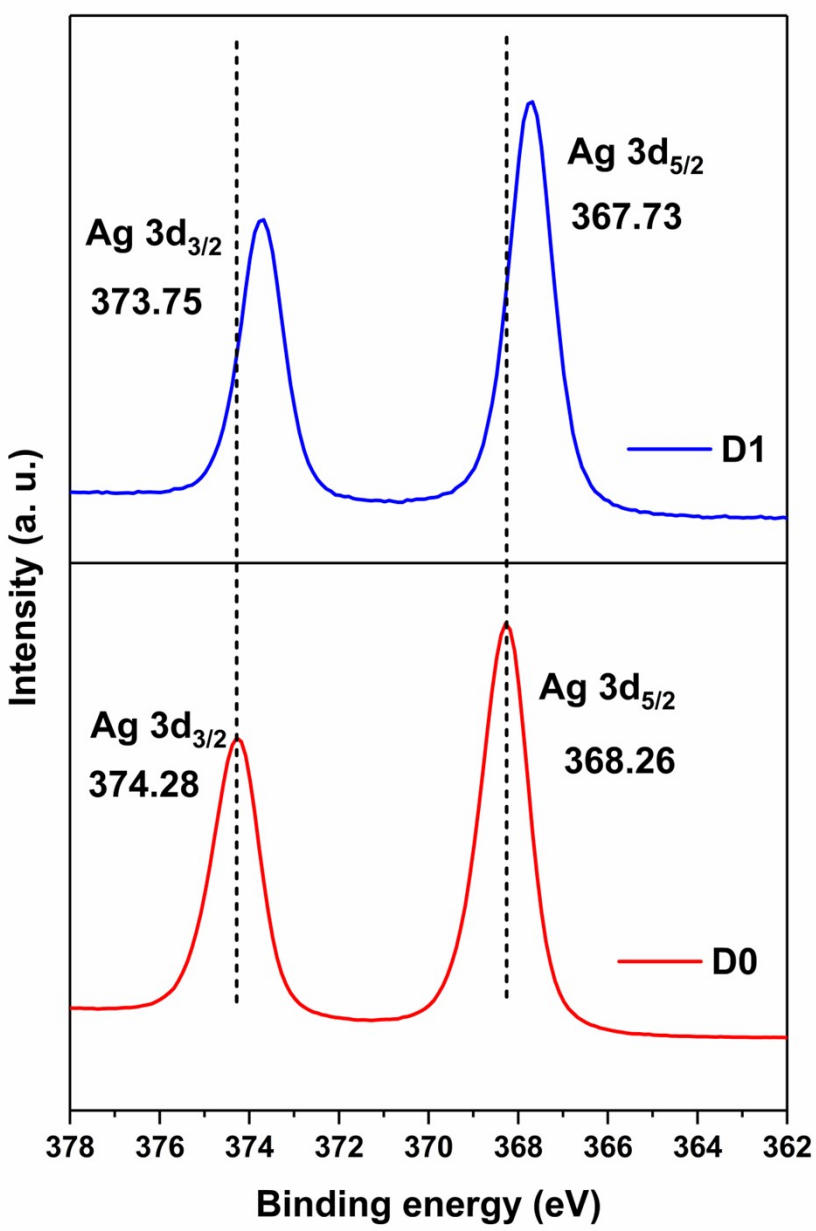

Figure S3. Comparison of high resolution XPS spectra of D0 and D1 samples.

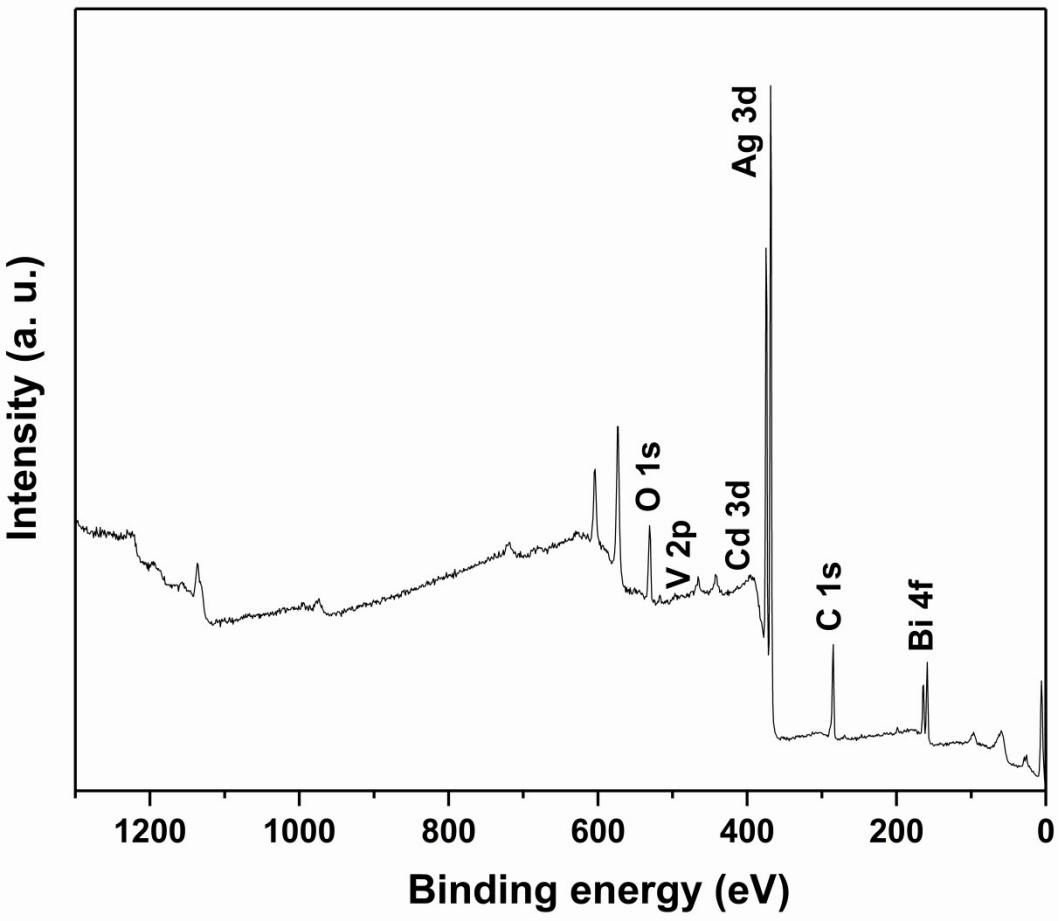

Figure S4. XPS survey spectrum of D1/10V catalyst.

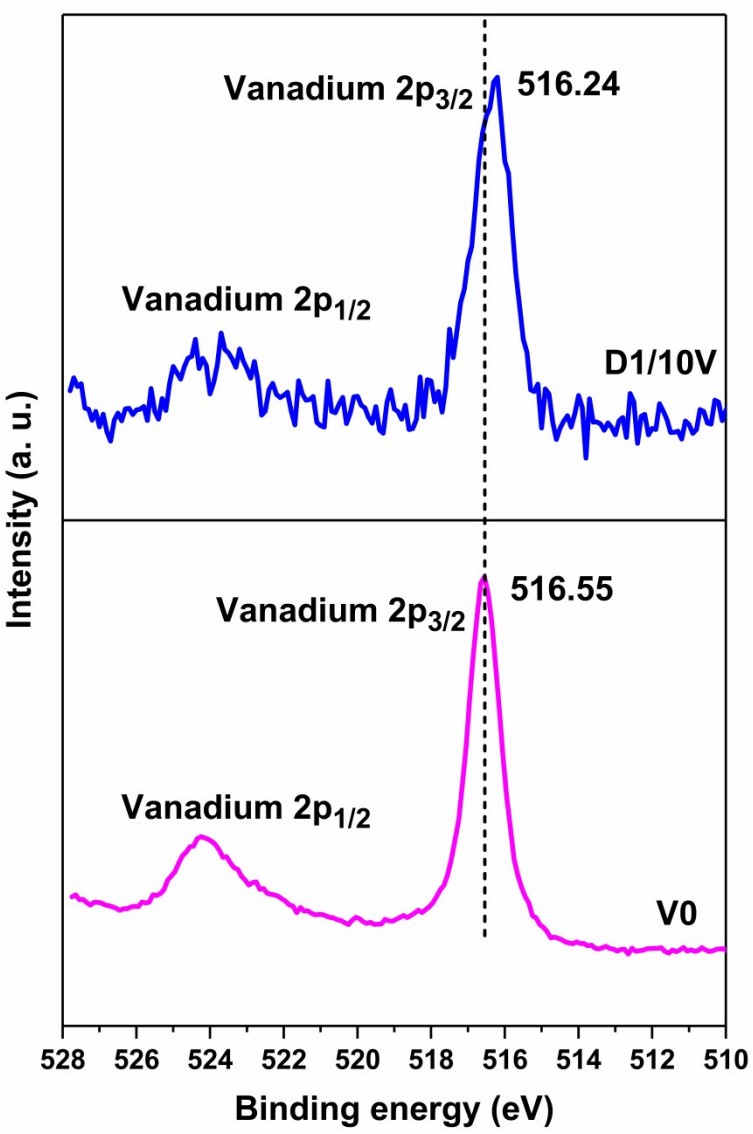

Figure S5. High resolution XPS of Vanadium 2p.

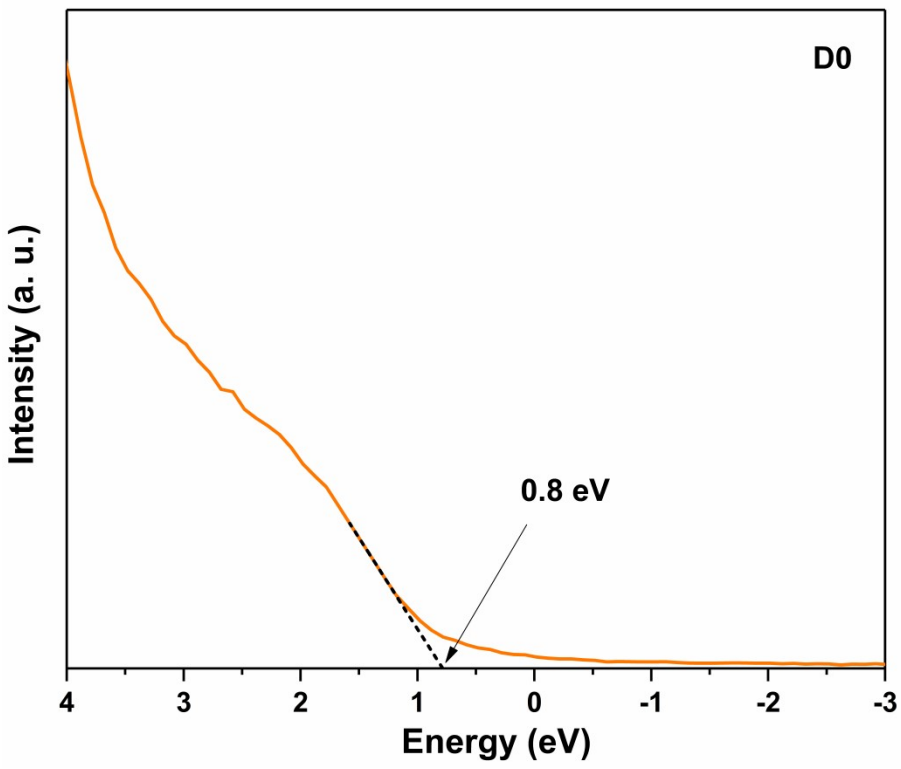

Figure S6. Valence band XPS spectrum of D0 sample.

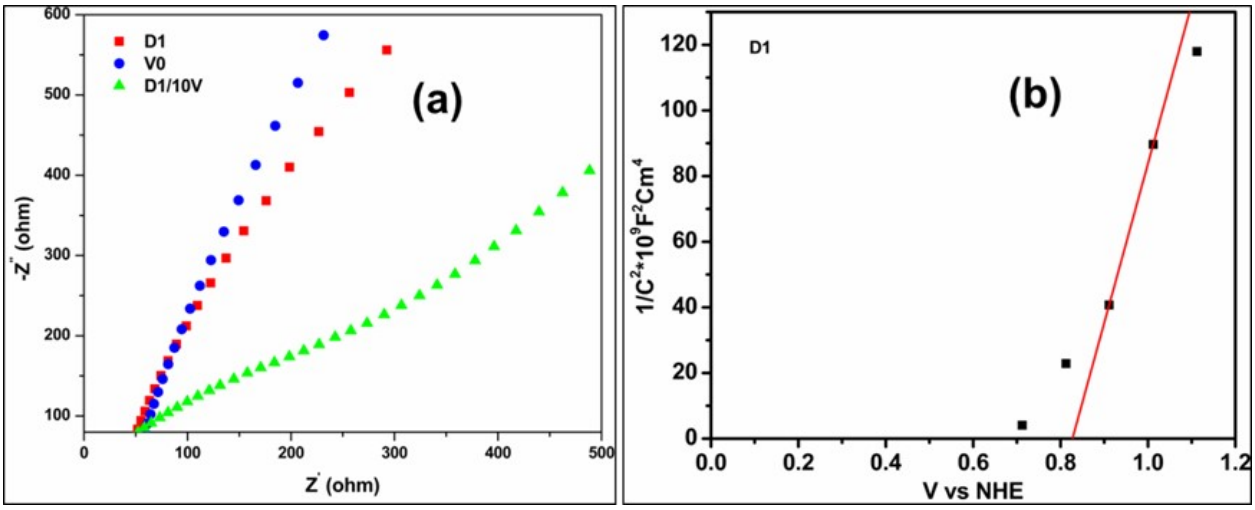

Figure S7. (a) Nyquist plot of D1, V0, and D1/10V photocatalysts. (b) Mott Schottky plot of Cd doped Ag_2O (D1).

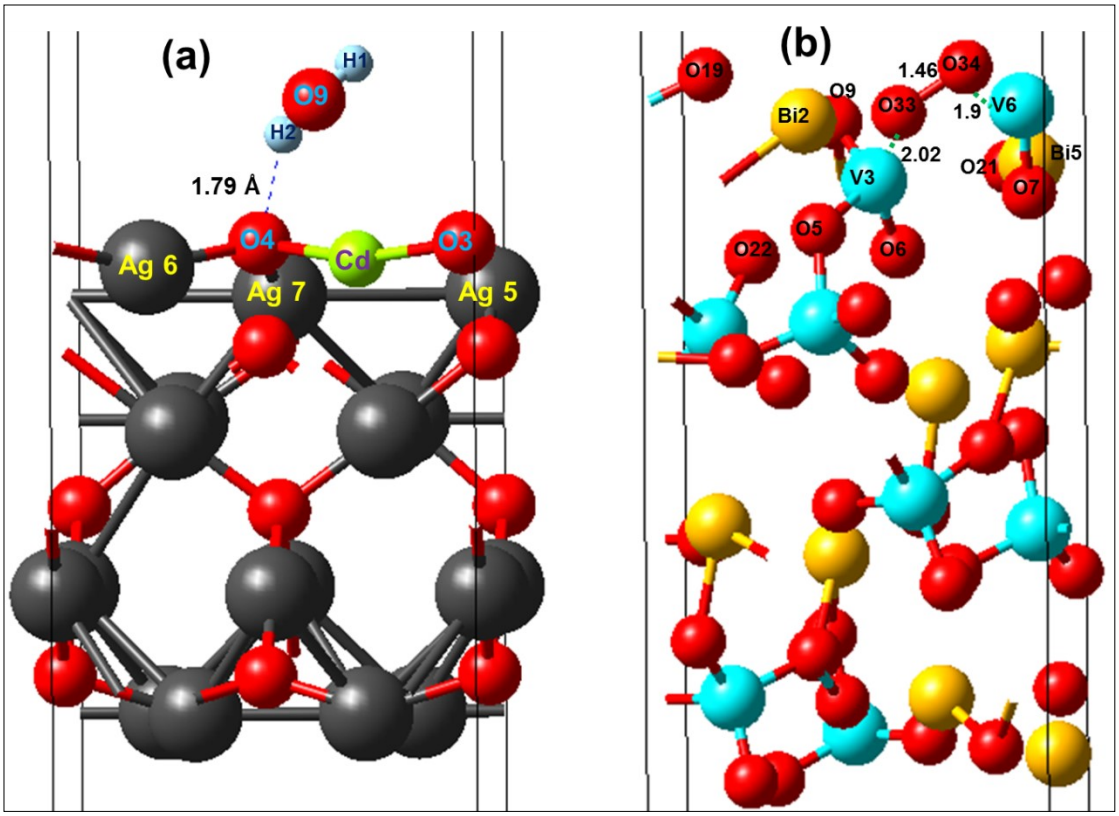

Figure S8. DFT calculation of (a) H_2O interaction with the Cd-doped Ag_2O (200) surface and (b) O_2 interaction with $BiVO_4$ surface.

Turnover frequency (TOF) analysis

Although the apparent rate constant can give a comparison of photocatalytic activity, it cannot quantitatively measure the photo-efficiency. The calculation of apparent rate constant does not take into consider the catalyst amount. TOF is the best candidate for the photo-efficiency comparison, which considers the catalyst amount. The experiment for the determination of TOF was same to the photocatalytic experiments. The LED light source was in the visible spectrum range of 410-720 nm. The exact power of the irradiation light (720 W/m^2) was measured using a SOLAR POWER METER (TM-206 model). The following relation calculates the TOF of the prepared photocatalysts,

$$TOF = \frac{\left[\frac{Number\ of\ moles\ of\ reactant}{Number\ of\ grams\ of\ catalyst}\right] \times Yield}{time}$$

Table S1. Turn over frequency (TOF) and rate constant of synthesized catalysts for the photo-degradation of CIP.

Catalysts	TOF (mole $g^{-1}min^{-1}$)	Rate constant (k_{app}) (min^{-1})
D1	2.25 x 10^{-6}	5.9 x 10^{-3}
V	3.17 x 10^{-7}	0.5 x 10^{-3}
D1/5V	2.06 x 10^{-6}	5.1 x 10^{-3}
D1/10V	2.97 x 10^{-6}	8.7 x 10^{-3}
D1/20V	7.58 x 10^{-7}	2.6 x 10^{-3}