*Supporting Information*

# Photocatalytic partial oxidation of methanol to methyl formate under visible light irradiation on Bi-doped TiO2 via tuning band structure and surface hydroxyls

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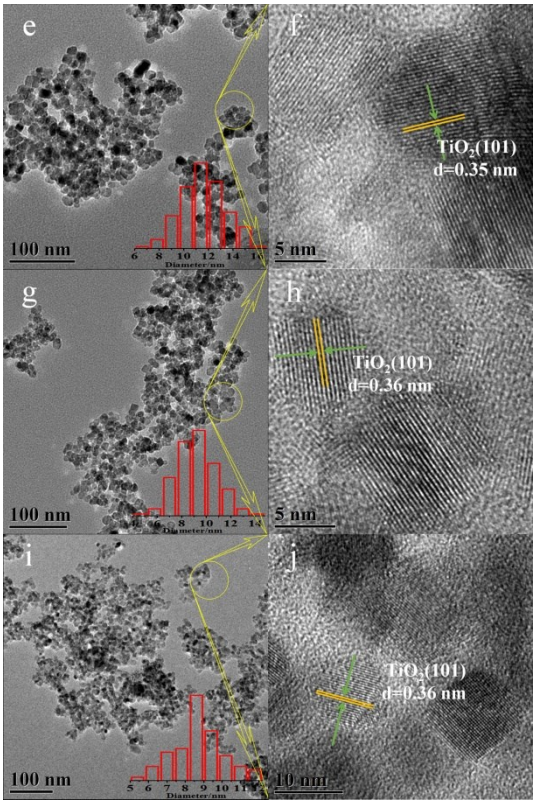


**Fig. S1**The TEM, HRTEM images of (e, f) 0.25Bi-$TiO_2$, (g, h) 1Bi-$TiO_2$, and (i, j) 2Bi-$TiO_2$ .

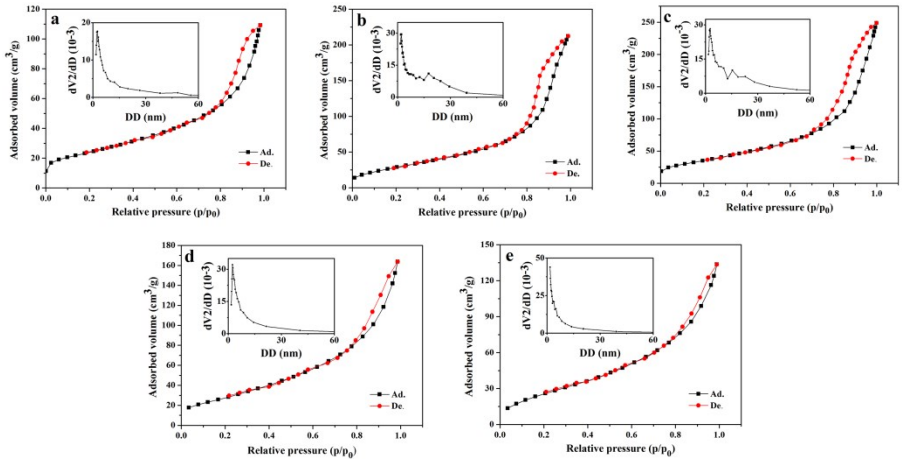


**Fig. S2** $N_2$adsorption-desorption isotherms and pore size distribution curves of (a) bare $TiO_2$, (b) 0.25Bi-$TiO_2$, (c) 0.5Bi-$TiO_2$, (d) 1Bi-$TiO_2$, and (e) 2Bi-$TiO_2$.

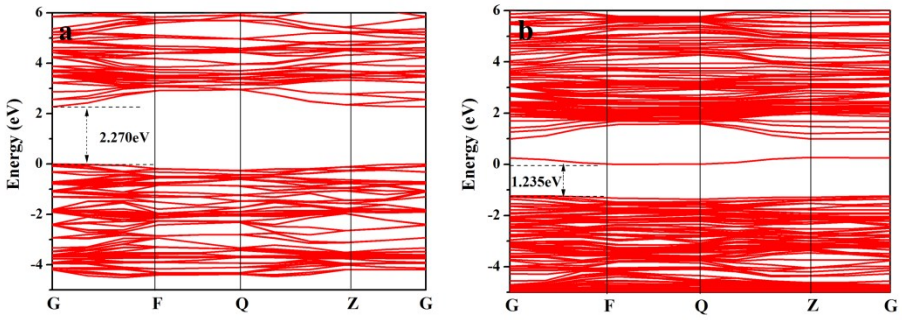


**Fig. S3** Band gap structure of (a) bare $TiO_2$, (b) Bi-$TiO_2$.

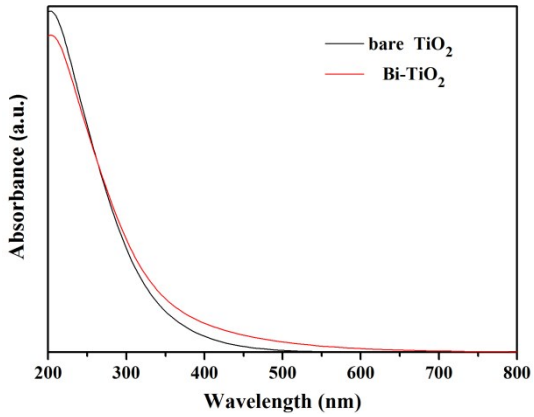


**Fig. S4** Optical absorption spectra.

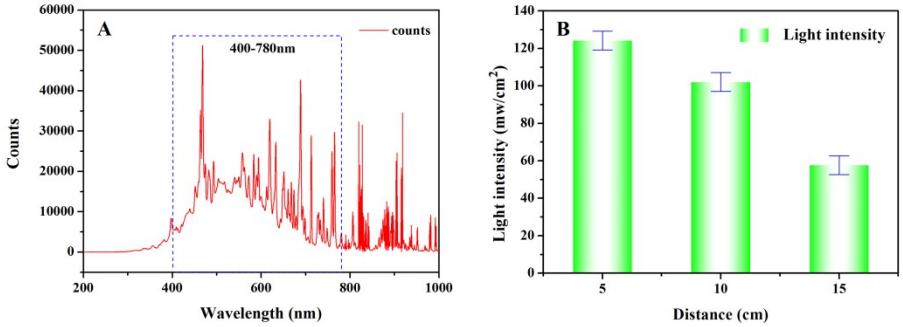


**Fig. S5** Spectrum of xenon lamp used in the experiment (A) and relation between light intensity and distance to the reactor (B).

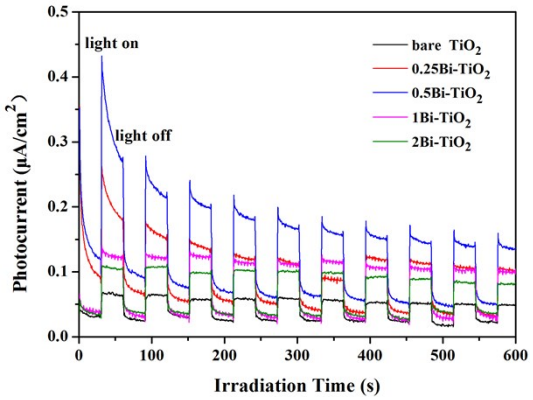


**Fig. S6** Chronoamperometric I-t curves of catalysts.