Supplementary Information for

Prediction of (TiO$_2$)$_x$(Cu$_2$O)$_y$ Alloys for Photoelectrochemical Water Splitting

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I. Partial density of states (PDOS) of (TiO$_2$)$_x$(Cu$_2$O)$_y$ alloys by the PBE functional

The energy levels of the VBM are set to zero. The red lines represent the p states, while the blue ones and the green ones represent the s states and the d states, respectively.

II. Band structure of selected (TiO$_2$)$_x$(Cu$_2$O)$_y$ alloys from the HSE06 calculations
The VBM$s$ are set to zero. The fractional coordinates of the k-points are as follows: $\Gamma$ (0.0, 0.0, 0.0), $A$ (0.4444, 0.4444, 0.5), $B$ (0.5, 0.0, 0.5), $C$ (-0.3333, 0.1333, 0.06667), $D$ (0.0, 0.4667, 0.0), $M$ (0.5, 0.5, 0.5), $X$ (-0.2333, 0.35, 0.0).