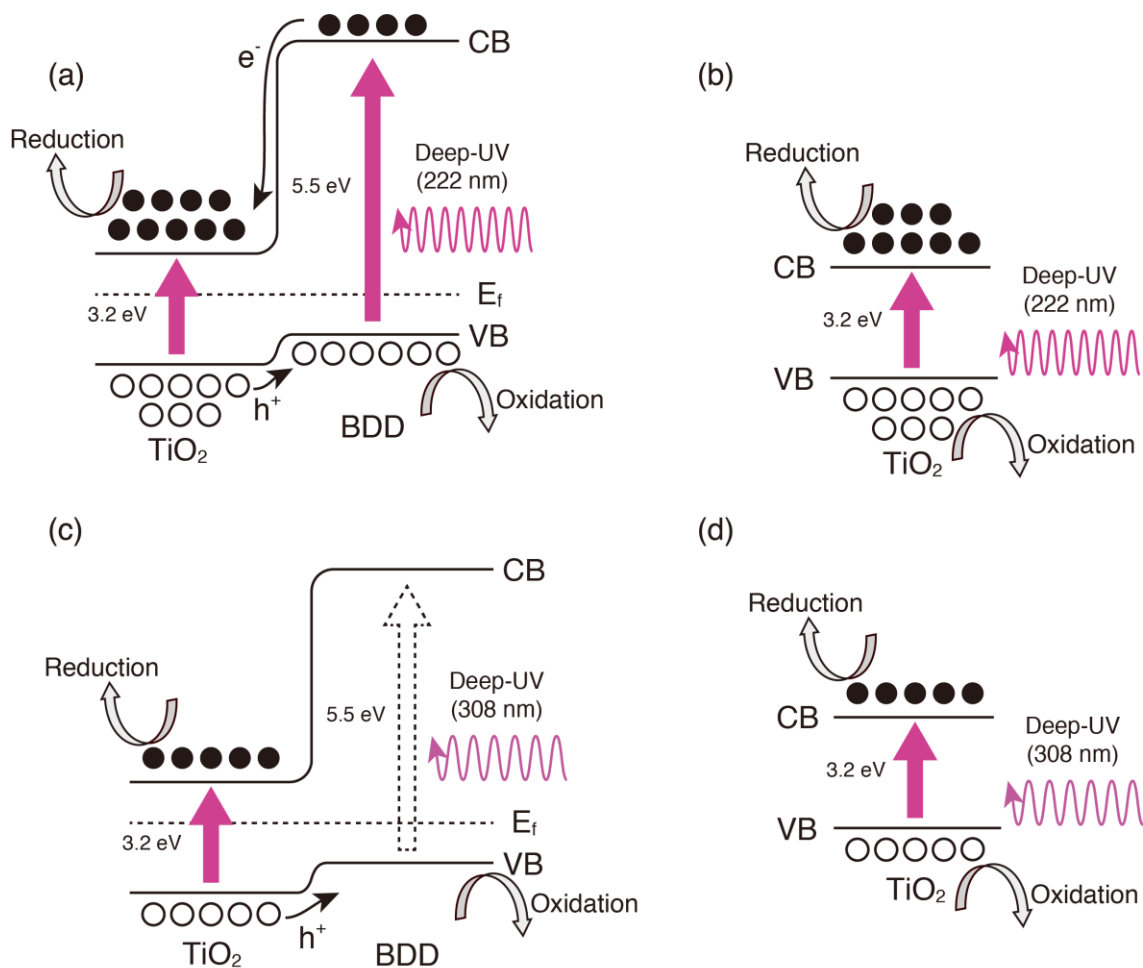
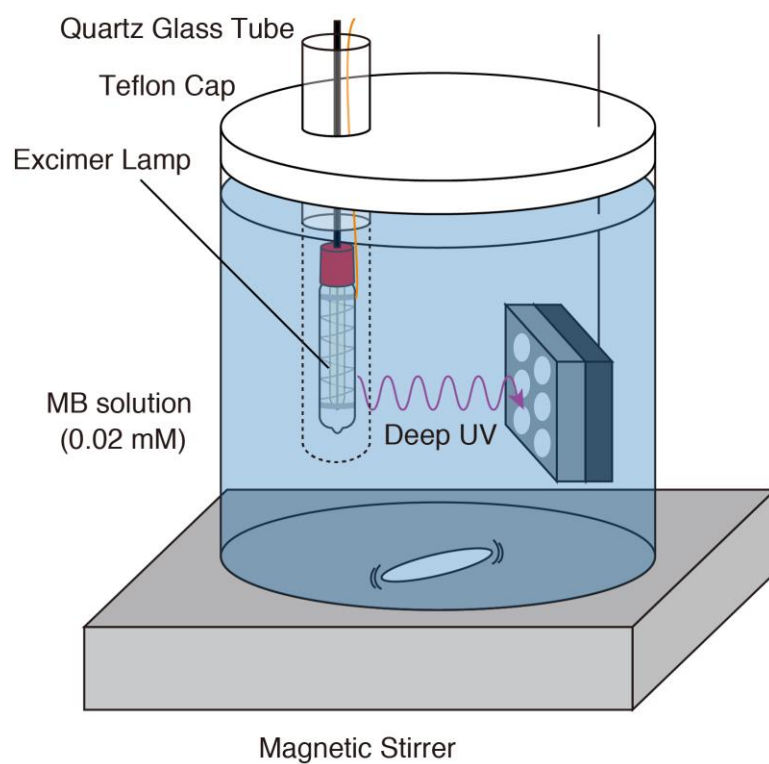


**Figure S1.** (a) Top- and (b) cross-sectional views of the BDD layer.



**Figure S2.** Energy diagram and transfer mechanism of photocarriers in (a,c) mesoporous  $\text{TiO}_2/\text{BDD}$  and (b,d)  $\text{TiO}_2/\text{glass}$  under (a,b) 222 nm and (c,d) 308 nm UV irradiation.



**Figure S3.** Schematic illustration of the experimental setup used for photocatalytic activity testing.