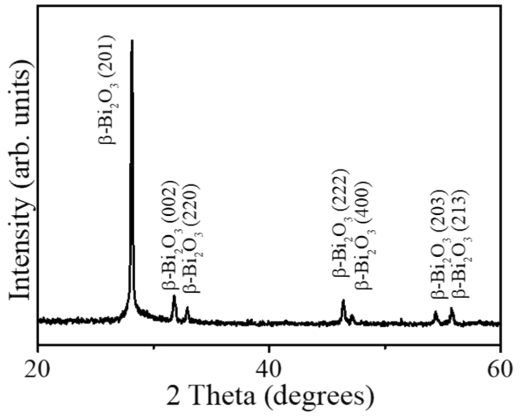

Fig. S1. XRD pattern of the Bi_2O_3 film formed via in-situ sputtering growth at 450°C.

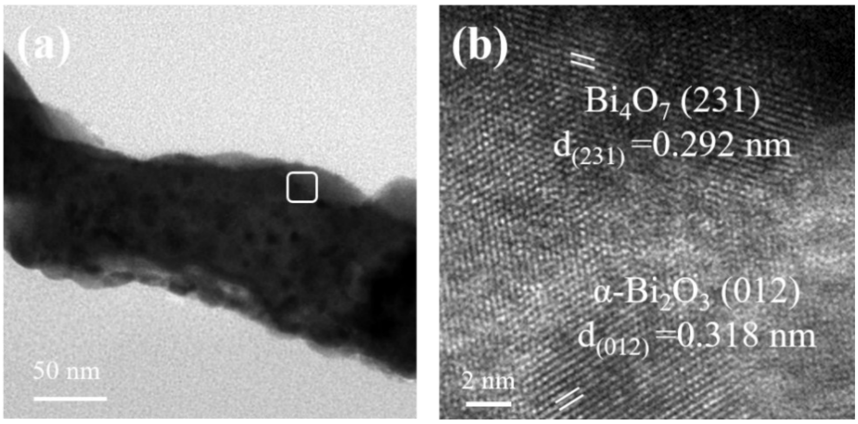

Fig. S2. TEM images of the a-425 Bi_2O_3 thin film. (a) A low-magnification image. (b) HRTEM image of the local region in the film.

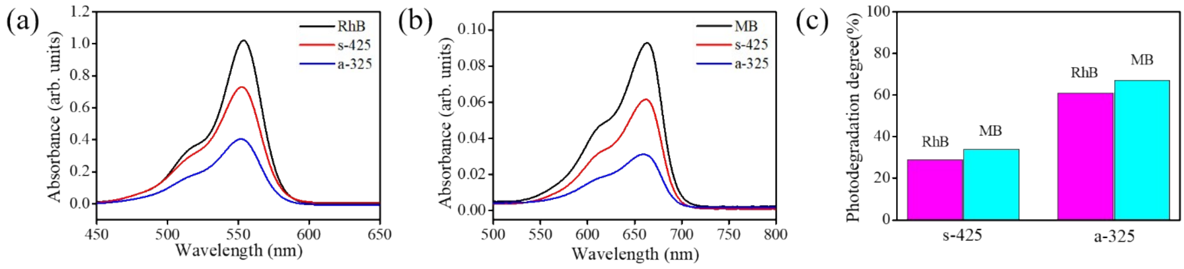

Fig. S3. The corresponding dye solution absorbance spectra intensity variations containing s-425 and a-325 Bi2O3 thin-film photocatalysts under 80 min visible light irradiation. (a) RhB solution. (b) MB solution. (c) The summarized photodegradation degrees for various thin-film photocatalysts.