Electronic Supplementary Information

Enhanced photocatalytic activity of $CdWO_4/BaTiO_3$ heterostructure for dye degradation

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Fig. S1 shows the Raman spectrum of $BaTiO_3$ was recorded with 514.5 nm excitation source wavelength (Ar^+ laser source) in the wavenumber 100-1000 cm^{-1}. This measurement was recorded in a backscattering mode using a 20× microscope objective lens. Typical laser power at the sample surface was 2.5 mW with a spot size of 2 μm diameter. The Raman peak positions appeared at 263, 305, 515 and 718 cm^{-1}. These are Raman active lattice vibration modes, especially 305 cm^{-1} and 718 cm^{-1}, that exhibit the characteristic features of $BaTiO_3$ tetragonal phase. Therefore, Raman spectrum of $BaTiO_3$ confirmed the tetragonal structure. Moreover, this tetragonal crystal structure exhibits ferroelectric property.

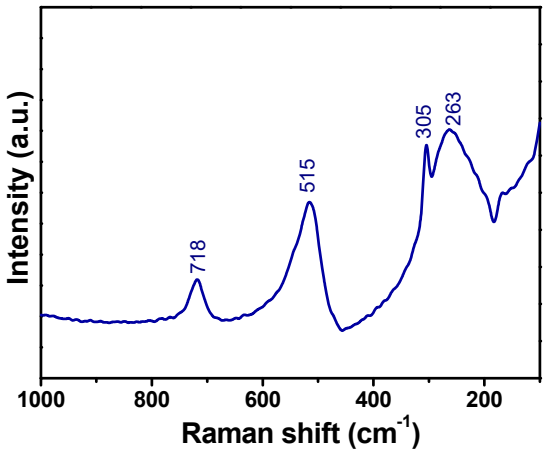

Fig. S1

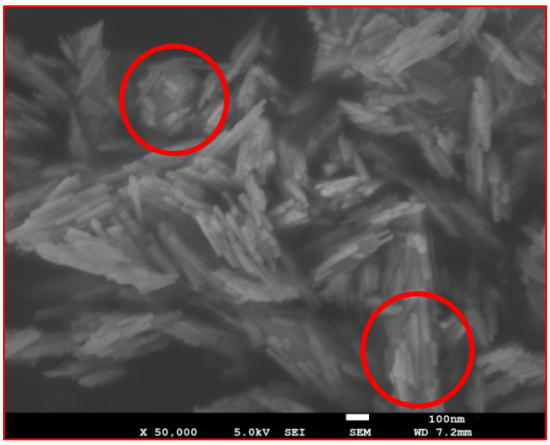

Fig. S2. FESEM image of $CdWO_4/BaTiO_3$ (70:30) heterostructure.

The obtained FESEM images (Fig. S2 and Fig. S3) along with colour mapping images clearly show the homogeneous distribution of both $CdWO_4$ and $BaTiO_3$ crystals in the heterostructure.

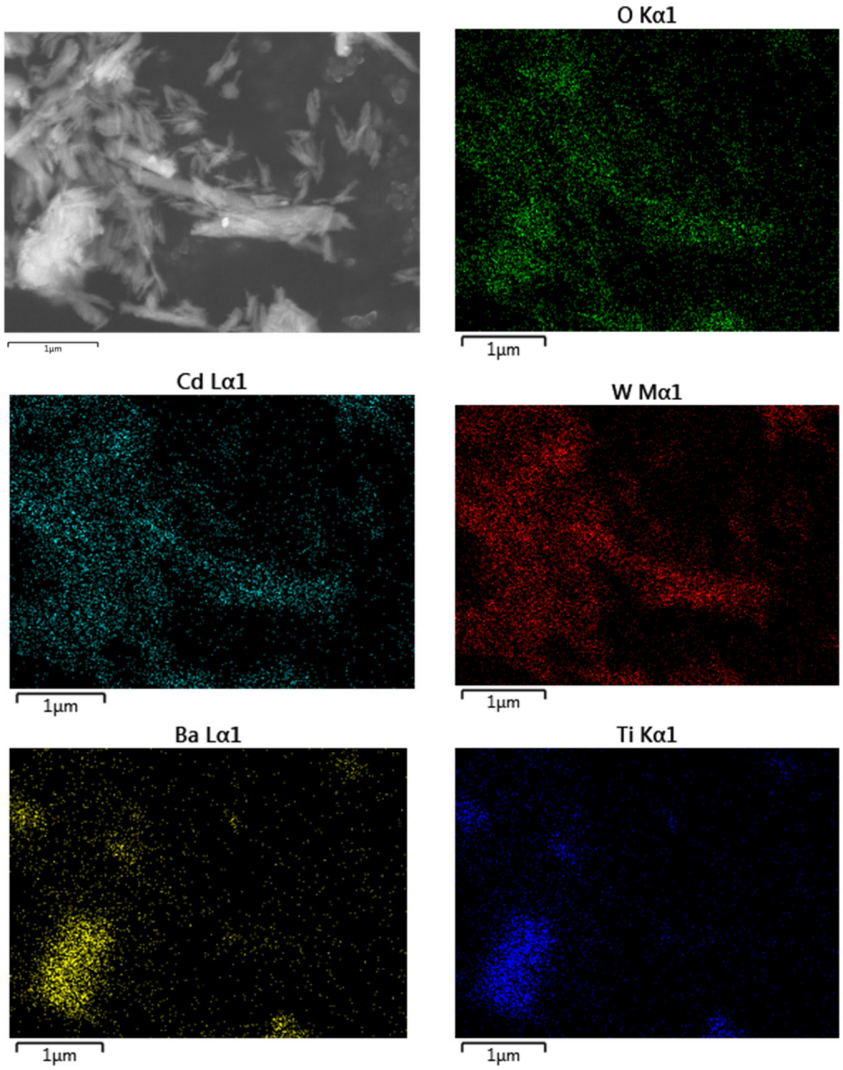

Fig. S3. FESEM image of $CdWO_4/BaTiO_3$ (70:30) heterostructure and color map images of O, Cd, W, Ba and Ti.

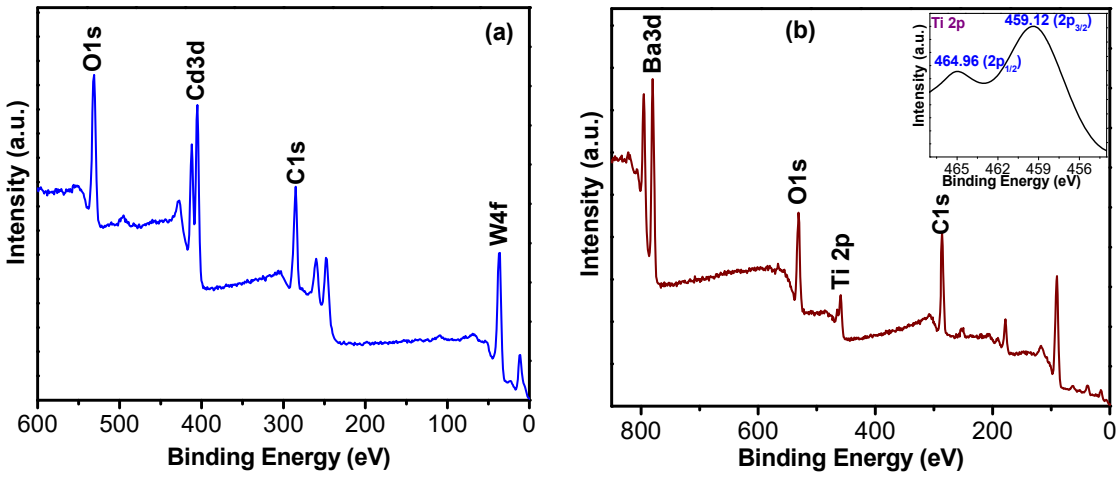

Fig. S4. The XPS survey spectrum of $CdWO_4$ (a) and $BaTiO_3$ (b). The inset of Fig. S4(b) shows the high resolution XPS spectra of Ti2p.