Supplementary Materials

Highly Effectual Photocatalytic Remediation of Tetracycline under the Broad Spectrum of Sunlight by Novel $BiVO_4/Sb_2S_3$ Nanocomposite

Shelly Singla [1,2], Pooja Devi [1,*] and Soumen Basu [2,*]

[1] Materials Science and Sensor Application, Central Scientific Instruments Organisation, Chandigarh 160030, India
[2] School of Chemistry and Biochemistry, Thapar Institute of Engineering and Technology, Patiala 147004, India
* Correspondence: poojaiitr@csio.res.in (P.D.); soumen.basu@thapar.edu (S.B.)

S1.1. Characterization methods

PAN analytical X′ Pert-Pro X-ray diffractometer with the radiation of Cu Kα, operated at 45 kV with a scan range of 10-80^o, step size 0.026^o, and wavelength = 1.5406 was used to assess the materials' X-ray diffraction analysis (XRD). The nitrogen sorption analysis was performed using a Microtrac Belsorp Mini-II (Bel, Japan, Inc) surface area analyzer. Prior to the evaluation, the samples were pre-treated in a nitrogen atmosphere at 100^{o}C for 5 h to prevent the trapping of undesirable pollutants and gases. The Brunner-Emmet-Teller (BET) method and Barrett Joyner-(BJH) Halenda's approach was used to inspect the pore size distribution and surface area curves, respectively. The pH was measured with a pH meter from Eutech (Singapore), model cyber scan pH 1100. The kinetics of samples by photocatalytic degradation of organic pollutants under sunshine by Analytik Jena spectrophotometer. The 75 W Xenon lamp (Shilpent, k < 400 nm) was used as a ultraviolet light source for carrying out degradation. A 65 W CFL lamp (Phillips, k > 400 nm) with intensity of 125 W/m^2 was made to use for supplying visible light for the photocatalytic reaction. UV–Vis diffuse reflectance spectroscopy (DRS) were examined using a Shimadzu UV 2600 spectrophotometer in diffused absorbance mode. At the excitation

wavelength of 325 nm and slit width of 5-10 nm of the as-prepared catalyst, photoluminescence (PL) spectroscopic experiments were performed using the Perkin Elmer LS-55, USA PL spectrometer. The oxidation states of metal oxides were determined using the PHI5200 X-ray photoelectron spectroscopy (XPS) system, which included an Omicron ESCA apparatus and a monochromatic Al K X-ray source (1486.7eV). JEOL instrument JSM-6510 was employed with the voltage of 15 kV to assess the morphological studies of as-prepared catalyst along with color mapping images. SEM-EDS was used to inspect the color spectra of the composite. TOC was measured using a TOC analyzer (Model: Multi N/C 2100 BU, Analytik Jena AG Corporation).

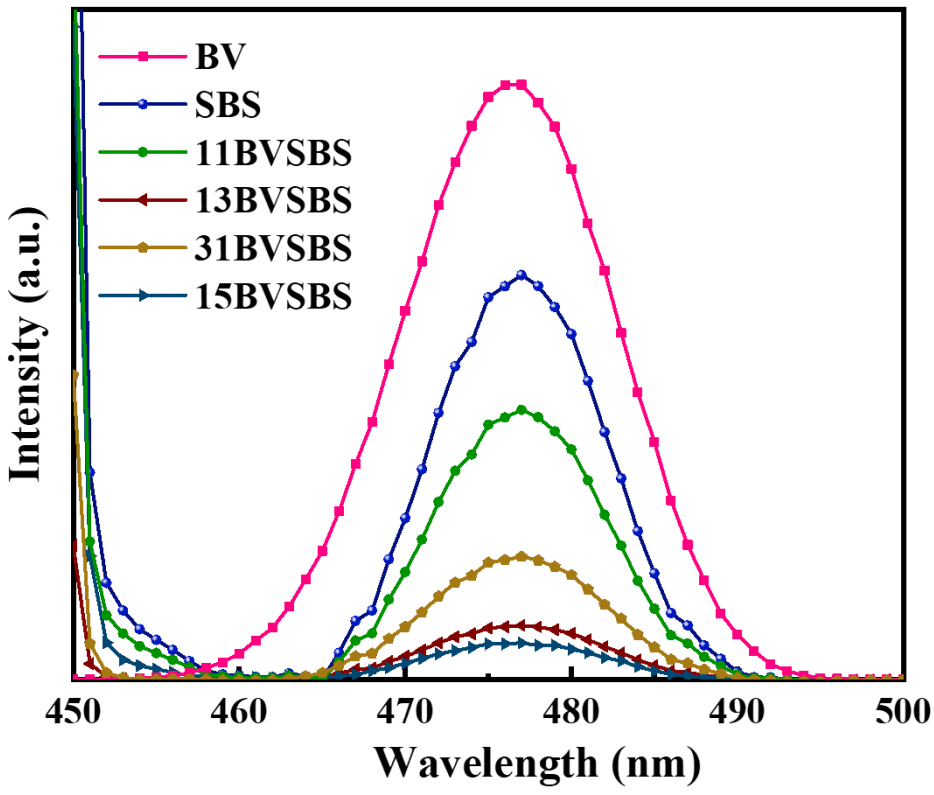

Figure S1. PL plot of the synthesized BV, SBS, 11BVSBS, 13BVSBS, 31BVSBS, and 15BVSBS photocatalysts.

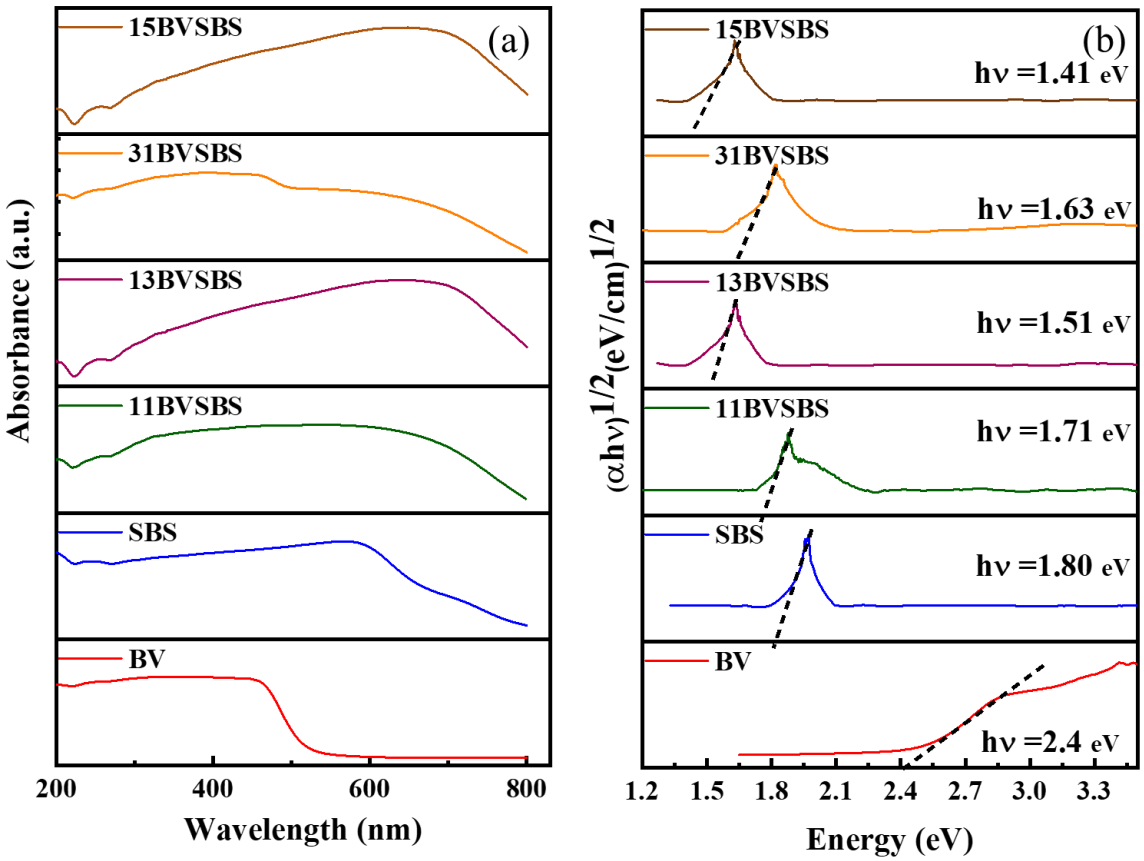

Figure S2. (a) Absorption spectrum, and (b) Band gap potential of the fabricated photocatalysts.

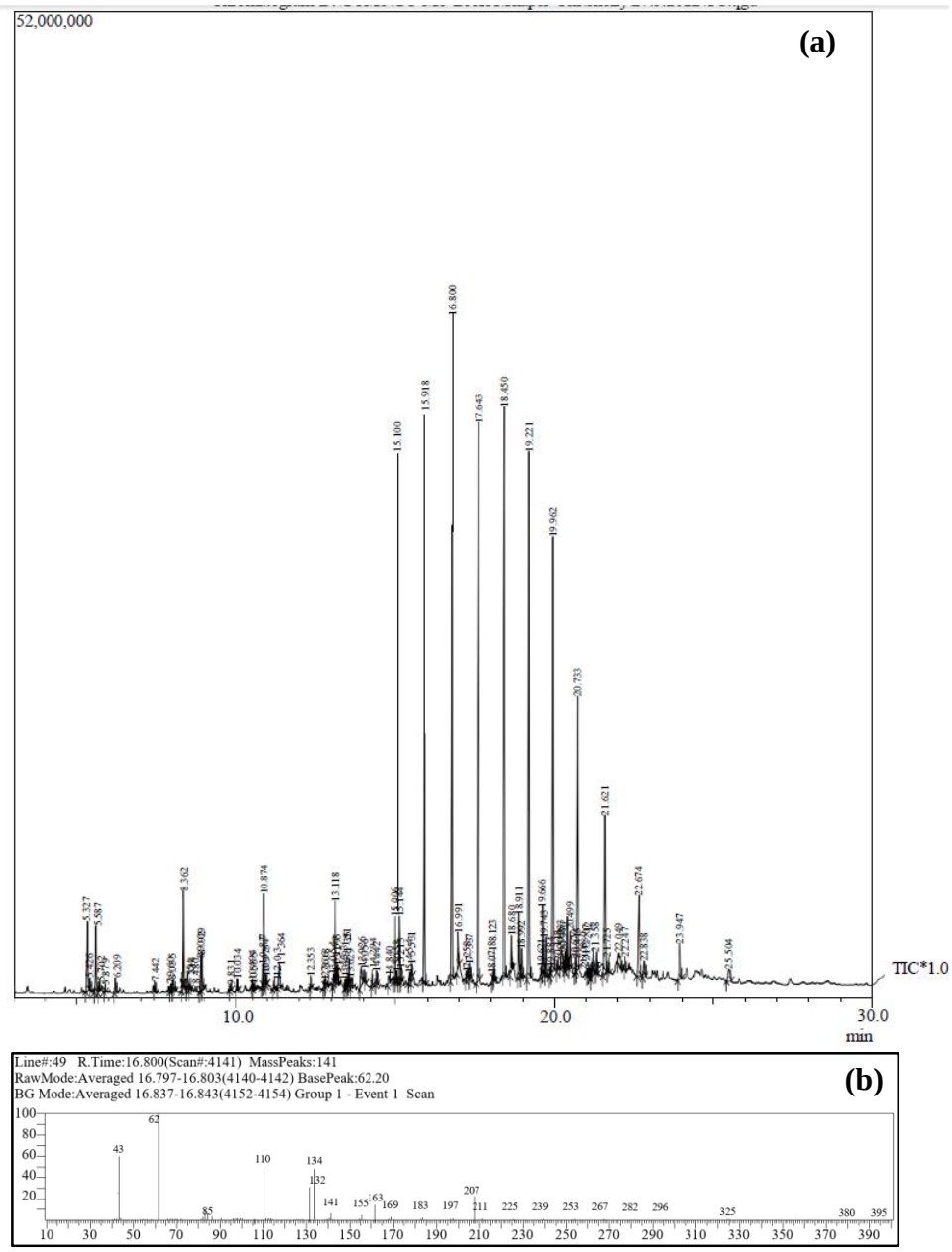

Figure S3. (a) Gas chromatogram, and (b) Mass spectra of the products after the degradation of TC by 13BVSBS photocatalyst.