SURFACTANT-FREE SYNTHESIS OF ZnO/Bi_2WO_6 FLOWERLIKE WITH UV-LIGHT-INDUCED PHOTOCATALYTIC ACTIVITY

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Abstract

I hereby present the recent experimental findings and the key concepts of our laboratory's research on photocatalytic degradation. Bi_2WO_6 with a flower-like structure was successfully synthesized by two different surfactants e.i. hexadecyltrimethylammonium bromide (CTAB) and polyvinylpyrrolidone (PVP), via hydrothermal method to control various properties of the resulting material (particle size, morphology, crystallinity, surface area, band gap, etc.). Subsequently, our investigation focused on the creation of a ZnO/Bi_2WO_6 heterojunction photocatalyst designed for efficient photodegradation of pollutants. To analyze the material's characteristics, we employed techniques including X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), X-ray photoelectron spectroscopy (XPS), and diffuse reflectance UV-vis spectroscopy (UV-DRS). However, the ZnO/Bi_2WO_6 heterojunction exhibited tunable properties and demonstrated highly efficient phenol degradation with a remarkable degradation rate compared to the as-synthesized Bi_2WO_6.