

Perovskite SrTiO₃ for Photo Catalytic and Optoelectronic Applications

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Abstract

In this work, we report synthesis of Perovskite Materials SrTiO₃ catalyst with efficient UV light driven photocatalytic activity towards methylene blue degradation. The phase purity, composition, surface morphology and band gap of as synthesized nanomaterials were characterized using various analytical techniques. The band gap is 3.2 eV, and the crystalline structure is identified to be perovskite. The photocatalytic efficiency of perovskite SrTiO₃ catalyst was tested on the degradation of methylene blue (MB) under ultraviolet light irradiation. A 10 ppm MB dye solution in water was degraded by about 68% for SrTiO₃ catalyst at 120 min. this result demonstrates the photocatalyst efficiency of SrTO₃, which may be attributed to the band gap, high adsorbing of the dye molecules on the surface, large surface area, and low electron-hole recombination. In addition, SrTO₃ demonstrated good stability towards photocatalytic degradation. PhotoCurrent and impedance spectrum were recorded. Finally, a suitable photocatalytic degradation mechanism has been proposed to indicate the photocatalytic performance of SrTO₃.

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