

Eu³⁺ Ions Doped-SnO₂ for Effective Degradation of Malachite Green Dye

Authors : Ritu Malik, Vijay K. Tomer, Satya P. Nehra, Anshu Nehra

Abstract : Visible light sensitive Eu³⁺ doped-SnO₂ nanoparticles were successfully synthesized via the hydrothermal method and extensively characterized by a combination of X-ray diffraction (XRD), Field emission scanning electron microscopy (FESEM) and N₂ adsorption-desorption isotherms (BET). Their photocatalytic activities were evaluated using Malachite Green (MG) as decomposition objective by varying the concentration of Eu³⁺ in SnO₂. The XRD analysis showed that lanthanides phase was not observed on lower loadings of Eu³⁺ ions doped-SnO₂. Eu³⁺ ions can enhance the photocatalytic activity of SnO₂ to some extent as compared with pure SnO₂, and it was found that 3 wt% Eu³⁺ -doped SnO₂ is the most effective photocatalyst due to its lowest band gap, crystallite size and also the highest surface area. The photocatalytic tests indicate that at the optimum conditions, illumination time 40 min, pH 6.5, 0.3 g/L photocatalyst loading and 50 ppm dye concentration, the dye removal efficiency was 98%.

Keywords : photocatalyst, visible light, lanthanide, SnO₂

Conference Title : ICCMS 2017 : International Conference on Chemistry and Materials Science

Conference Location : Zurich, Switzerland

Conference Dates : July 27-28, 2017