

Photocatalytic Activity of LaSr₂AlO₅:Eu Ceramic Powders

Carlos R. Garcia, Jorge Oliva, Luis A. Diaz-Torres.

Photochemistry and Photobiology, Vol. 91, 505–509.

DOI: 10.1111/php.12428

Abstract

The photocatalytic activity, of undoped and Europium-doped LaSr₂AlO₅ powders, has been investigated by degrading methylene blue dye in water solutions. Those powders were fabricated by a combustion method and an annealing treatment in air. All samples showed a tetragonal single phase according to by X-ray diffraction measurements (XRD). Scanning electron microscopy (SEM) revealed irregular semioval grains with sizes in the range of 3.5–4.27 μm. Photoluminescence spectrum showed sharp emission peaks at 588 nm and at 617 nm which are associated with ⁷F₁, ⁷F₂ → ⁵D₀ Eu³⁺ ion forbidden transitions, respectively, under UV light excitation of 322 nm. The methylene blue (MB) degradation under UV light (254 nm) was studied by monitoring changes in the absorbance peak of MB at 665 nm. Finally, LaSr₂AlO₅:Eu powders were used three times and the efficiency for the degradation of MB decreased from 100 to 61% after the third cycle of use.