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# An enhancement of photoluminescence property of Ag doped $\text{La}_2\text{O}_3$ thin films at room temperature

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## Abstract

Metal transition doped oxide thin films or nanocomposites have recently emerged at the forefront of potentials research. With the focus mainly on efficiency, the aspect of stability against optical irradiation of such materials has so far not been thoroughly addressed. This work covers the synthesis of silver doped Lanthanum oxide thin films ( $\text{La}_2\text{O}_3:\text{Ag}$ ) which have been prepared by the spray pyrolysis technique on glass substrates at  $460^\circ\text{C}$ . Then, Ag thin films were grown on Lanthanum oxide thin films by thermal evaporation. The present work aims to reach the synthesis of  $\text{La}_2\text{O}_3:\text{Ag}$  thin films using both the spray pyrolysis and thermal evaporation techniques. First, X-ray diffraction analysis shows that undoped and Ag doped films crystallize in a mixture of hexagonal and cubic phase with crystallites oriented along (001) direction. Raman spectroscopy shows the bands positions corresponding to hexagonal and cubic phases. On the other hand, an attempt regarding their optical properties has been carried out by means of photoluminescence measurements. Second, from electrical conductivity measurements, the activation energy decreases from 1.42 to 1.09 eV with the increase of annealing time and the charge carriers are following the CBH model as dominant

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