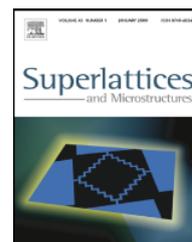




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Facile synthesis and optical properties of Co_3O_4 nanostructures by the microwave route

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ABSTRACT

Cobalt oxide (Co_3O_4) nanoplatelet shape like nanostructures have been successfully synthesized through a simple microwave route for the first time using cobalt acetate, NaOH and citric acid at 200 °C for 30 min. The structure and morphology of as-prepared Co_3O_4 nanoplatelets are characterized by means of powder X-ray diffraction (XRD), Fourier transform infrared spectrum (FTIR), and scanning electron microscope (SEM). XRD measurements indicate that the product has a perfect crystalline cubic phase of Co_3O_4 with a lattice constant $a = 8.082 \text{ \AA}$. The SEM images show that the obtained Co_3O_4 nanopowder consists of nanoplatelets with diameter 125 nm and thickness 20 nm. Energy-dispersive X-ray spectroscopy (EDS) show that the composition of Co_3O_4 is stoichiometric. Room temperature photoluminescence measurement is exhibited by a strong UV emission and a suppressed green emission, confirming the good optical properties for the as-prepared Co_3O_4 nanoplatelets.

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1. Introduction

Recently, nanostructure metal oxide semiconductors have attracted much attention due to their technological applications and intriguing properties [1]. The unique physical properties of nanoparticles, due to surface or quantum-size effects, have recently been the subject of intense research, in terms of both scientific interest and industrial application and present new challenges

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