

(Article: 40)

SYNTHESIS AND CHARACTERIZATION OF LEAD IODIDE (PbI_2) THIN FILMS BY SOLUTION ROUTE

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ABSTRACT

Thin films of Lead Iodide (PbI_2) were prepared by sol-gel dip-coating method by using easily available low cost materials as we use powdered PbI_2 (purity ~ 99.8%) from the market. X-ray diffraction (XRD) spectrum showed all the peaks prominently as (002), (003) and (004) of crystalline PbI_2 . From the XRD analysis it was confirmed that PbI_2 films were polycrystalline in nature with hexagonal in structure. The amount of strain was obtained 1.7×10^{-2} and the particle size as ~24 nm, indicating the nano structural nature of the film. From UV-Visible spectrophotometric measurement and the standard plot of $(\alpha h\nu)^2$ with $h\nu$ the optical band gap of the film was found 2.36eV for the wavelength range 300-1100 nm.

Key words: Lead Iodide (PbI_2), Thin Films, Optical Properties

INTRODUCTION

Lead iodide (PbI_2) is one of the important semi-conducting materials for radiation detectors [1-3] at room temperature. Lead iodide found scopes in medical applications [4-6] for its high atomic number and having large band gap energy. It also can be used in view of its potential as a device material and particularly for its photosensitive in nature not only that photoconductivity, photo decomposition, image recording capability, electron spin resonance have been reported.

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