A study on linear and non-linear optical constants of Rhodamine B thin film deposited on FTO glass

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PHYSICA B-CONDENSED MATTER
Volume: 490 **Pages:** 25-30
DOI: 10.1016/j.physb.2016.03.003
Published: JUN 1 2016
View Journal Impact

Abstract

The aim of this research was to fabricate/deposit the good quality thin film of Rhodamine B dye on fluorine doped tin oxide glass substrate by the low cost spin coating technique and study their linear and nonlinear optical parameters. The thickness of the thin film was measured about 300 nm with alpha step system. The transmittance of the fabricated thin film was found to be above 75% corresponding to the fluorine doped tin oxide layer. The structural analysis was performed with X-rays diffraction spectroscopy. Atomic force microscope showed the topographic image of deposited thin film. Linear optical constant like absorption coefficient, band gap, and extinction index was calculated. The dielectric constant was calculated to know the optical response of Rhodamine B dye over fluorine doped tin oxide substrate. The nonlinear optical constant like linear optical susceptibility in, nonlinear optical susceptibilityi chi((3)), nonlinear refractive index (n(2)) were calculated by spectroscopic method. This method has advantage over the experimental method like Z-Scan for organic dye base semiconductors for future advance optoelectronics applications like dye synthesis solar cell. (C) 2016 Elsevier B.V. All rights reserved.

Keywords

Author Keywords: Organic fluorescence dye; Rhodamine B/FTO; XRD/AFM; Linear refractive index; Non-linear refractive index; Non-linear susceptibility; Dielectric properties

KeyWords Plus: SENSITIZED SOLAR-CELLS; REFRACTIVE-INDEX; DEVICES; SUSCEPTIBILITIES; CHALCOGENIDES; ABSORPTION; ELECTRODES; ROUGHNESS; DYES; GAP

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Funding

Funding Agency	Grant Number

Vice Deanship of Research Chairs, King Saud University

View funding text

Publisher

ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS

Categories / Classification

Research Areas: Physics

Web of Science Categories: Physics, Condensed Matter

Document Information

Document Type: Article

Language: English

Accession Number: WOS:000373195600005

ISSN: 0921-4526

eISSN: 1873-2135

Journal Information

Table of Contents: Current Contents Connect

Impact Factor: Journal Citation Reports

Other Information

IDS Number: DI0OF

Cited References in Web of Science Core Collection: 50

Times Cited in Web of Science Core Collection: 5