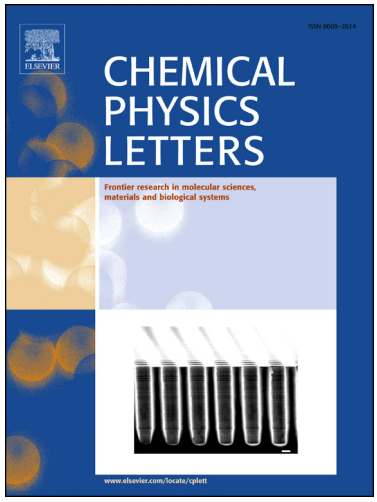

Design, Synthesis and nonlinear optical properties of (E)-1-(4-substituted)-3-(4-hydroxy-3-nitrophenyl) prop-2-en-1-one compounds

Amrita Saha, Vijay Shukla, Sudip Choudhury, J. Jayabalan

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Design, Synthesis and nonlinear optical properties of (E)-1-(4-substituted)-3-(4-hydroxy-3-nitrophenyl) prop-2-en-1-one compounds

Amrita Saha[a], Vijay Shukla[b], Sudip Choudhury[a], J. Jayabalan[b,*]

[a] *Department of Chemistry, Assam University, Silchar, India-788011.*
[b] *Ultrafast Spectroscopy Laboratory, Laser Physics Applications Section, Raja Ramanna Centre for Advanced Technology, Indore, India-452013.*

Abstract

A new series of (E)-1-(4-substituted)-3-(4-hydroxy-3-nitrophenyl)prop-2-en-1-one compounds have been synthesized by Claisen-Schmidt condensation reaction. Nonlinear optical characterization were carried out using z-scan technique with nanosecond pulses. These samples are found to exhibit strong nonlinear absorption at 532 nm and the nonlinear absorption coefficient of these samples exponentially increases with the increase of phonon characteristic energy. This relation speaks the role of phonon in the origin of nonlinear absorption in these compounds. The reported dependence of optical nonlinearity of the chalcone derivatives on the phonon characteristic energy will help in designing similar class of new molecules with high nonlinear coefficients.

Keywords: Chalcone, Nonlinear absorption, Phonon Contribution, Two-Photon Absorption.

1. Introduction

Large nonlinear optical coefficient, good transparency, high thermal and chemical stability are some of the most important requirements for a good nonlinear optical (NLO) material [1, 2, 3]. In the field of photonics, the search for advanced nonlinear optical materials possessing all these properties are

*Corresponding author
Email address: jjaya@rrcat.gov.in (J. Jayabalan)