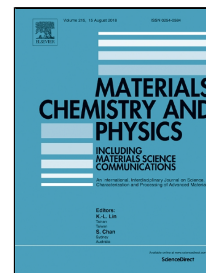


Accepted Manuscript

Structural, Thermal and Nonlinear Optical Studies on Novel Organic Cyclohexylammonium Hydrogen Adipate crystal

R. Gomathi, S. Madeswaran



PII: S0254-0584(18)30642-4
DOI: 10.1016/j.matchemphys.2018.07.051
Reference: MAC 20836
To appear in: *Materials Chemistry and Physics*
Received Date: 25 January 2018
Accepted Date: 22 July 2018

Please cite this article as: R. Gomathi, S. Madeswaran, Structural, Thermal and Nonlinear Optical Studies on Novel Organic Cyclohexylammonium Hydrogen Adipate crystal, *Materials Chemistry and Physics* (2018), doi: 10.1016/j.matchemphys.2018.07.051

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Structural, Thermal and Nonlinear Optical Studies on Novel Organic Cyclohexylammonium Hydrogen Adipate crystal

R. Gomathi, S. Madeswaran*

Advanced Materials Research Centre, Department of Physics, Vellore Institute of Technology, Vellore-632014, India.

*Corresponding author Email: madeswaran.s@vit.ac.in

Abstract

Single crystal of cyclohexylammonium hydrogen adipate (CYHAD) was grown from slow evaporation solution growth technique. The crystal structure and lattice parameters were determined by single crystal X-ray diffraction analysis. The material crystallized in monoclinic crystal system (P21/c). The FT-IR and CHN analysis were used to conform the functional group present in CYHAD. The material has high transparency with negligible absorption in the entire visible region and the optical band gap was found to be 4.90 eV. The PL spectrum shows the blue emission of CYHAD. The CYHAD crystal was stable up to 168.01 °C and the laser damage threshold of CYHAD was 9.74 GW/cm². Electrical properties were studied using LCR impedance analyzer. The third order nonlinear properties ($n_2 = -5.124 \times 10^{-8}$ cm²/W, $\beta = 0.024 \times 10^{-4}$ cm/W and $\chi^3 = 2.443 \times 10^{-6}$ esu) were calculated using 532 nm diode pumped CW Nd:YAG Laser and optical limiting behavior endorse that the CYHAD material is favorable for optoelectronic applications.

Keywords: Crystal structure, Organic compounds, Nonlinear optic materials, Optical limiting, Dielectric materials

Download English Version:

<https://daneshyari.com/en/article/7921193>

Download Persian Version:

<https://daneshyari.com/article/7921193>

[Daneshyari.com](https://daneshyari.com)