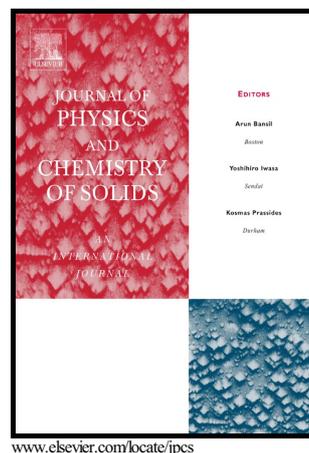


Author's Accepted Manuscript

Synthesis, X-Ray crystal structure and highly non-linear optical properties of inorganic-organic hybrid compound: 1,4-Diazbicyclo-octane oxonium tri-nitrates single crystal

Rokaya henchiri, Nasreddine Ennaceur, Marie Cordier, Isabelle Ledoux-Rak, Elimame Elaloui



PII: S0022-3697(16)31121-0
DOI: <http://dx.doi.org/10.1016/j.jpcs.2017.02.011>
Reference: PCS7993

To appear in: *Journal of Physical and Chemistry of Solids*

Received date: 21 November 2016
Revised date: 15 February 2017
Accepted date: 19 February 2017

Cite this article as: Rokaya henchiri, Nasreddine Ennaceur, Marie Cordier, Isabelle Ledoux-Rak and Elimame Elaloui, Synthesis, X-Ray crystal structure and highly non-linear optical properties of inorganic-organic hybrid compound 1,4-Diazbicyclo-octane oxonium tri-nitrates single crystal, *Journal of Physical and Chemistry of Solids*, <http://dx.doi.org/10.1016/j.jpcs.2017.02.011>

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 galley proof before it is published in its final citable 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

Synthesis, X-Ray crystal structure and highly non-linear optical properties of inorganic-organic hybrid compound: 1,4-Diazbicyclo-octane oxonium tri- nitrates single crystal.

Rokaya henchiri^{1,2}, Nasreddine Ennaceur^{1,2*}, Marie Cordier³, Isabelle Ledoux-Rak² and

Elimame Elaloui¹

¹Laboratory of Materials, Energy and Environment UR14-ES26, University of Gafsa, 2100 Gafsa, Tunisia.

² Laboratory of Quantum and Molecular Photonics, Institut d'Alembert, Ecole Normale Supérieure de Cachan, 94230 Cachan, France.

³ Molecular Chemistry Laboratory, UMR 9168, Ecole Polytechnique, CNRS, 91128 Palaiseau Cedex, France

*Corresponding Author. Tel : (+216) 55 000 481. nasr.ennaceur@yahoo.fr

Abstract

A new nonlinear optical hybrid crystal 1,4-Diazbicyclo[222]octane oxonium tri-nitrates (DOTN), of the dimension $4 \times 12 \times 1 \text{ mm}^3$. The crystal was grown using water as solvent at room temperature and crystal structure was determined by X-Ray diffraction respectively, this title compound was shown to crystallize in non-centrosymmetric trigonal system with space group P31c. The recorded FTIR spectrum has proven the presence of various functional groups in the grown crystal as well as the formation of DOTN. Besides, the thermal stability and melting temperature of the DOTN crystal were identified from the TG/DSC analysis. The suitability of this material for optical application was studied by non-linear optical (NLO) and UV-Visible absorption techniques. Furthermore, the nonlinear optical property was analyzed by Kurtz-Perry powder technique and was 3.4 times than that of KDP (potassium dihydrogen phosphate) single crystals. The first hyperpolarizability of nitrate was determined by Second Harmonic light Scattering.

Keywords: Crystal structure, X-ray diffraction, Optical materials, High nonlinearity, Infrared Spectroscopy; Thermal Behavior.

1.Introduction

Download English Version:

<https://daneshyari.com/en/article/5447557>

Download Persian Version:

<https://daneshyari.com/article/5447557>

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