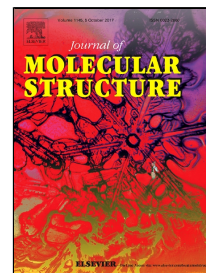


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STRUCTURAL, SPECTRAL AND BIREFRINGENCE STUDIES OF SEMIORGANIC NONLINEAR OPTICAL SINGLE CRYSTAL: CALCIUM5-SULFOSALICYLATE

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Abstract

Semi-organic nonlinear optical crystal Calcium5-Sulfosalicylate (CA5SS) was grown by slow evaporation solution growth technique. The cell parameters and molecular structure of the grown crystal were studied by single crystal x-ray diffraction analysis. The presence of various functional groups of the grown crystal was confirmed using Fourier transform infrared (FT-IR), Fourier transform Raman (FT-Raman) analysis. UV-Visible spectrum shows that CA5SS crystals have high transmittance in the range of 330–900 nm. The refractive index, birefringence and transient photoluminescence properties of the grown crystal were analyzed. The frequency doubling of the grown crystal (CA5SS) were studied and compared with that of KDP.

Key words: Crystal structure; FT-IR analysis; Transmittance; Calcium compounds;

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1. Introduction

Crystal engineering has the main objective to understand the intermolecular interactions and principle of packing in molecular crystals and also helps in the deliberate design of novel materials with NLO application targeted structures and properties. The ability of hydrogen bonding modification of the chemical compounds changes the optical properties of corresponding crystals. The lack of boundless π -electron delocalization, moderate optical nonlinearity, low optical transparency, low laser damage threshold, lack of quality and bulk size are the major limitations in organic nonlinear optical (NLO) crystals. In order to beat the above shortcomings, some new class of crystals such as semi-organic crystals have been developed. The coordination ability of organic acids

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