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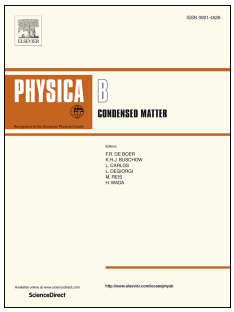


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J. Johnson, R. Srineevasan, D. Sivavishnu

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# PROCESS DEVELOPMENT AND CHARACTERIZATION OF CENTROSYMMETRIC SEMIORGANIC NONLINEAR OPTICAL CRYSTAL: 4-DIMETHYLAMINOPYRIDINE POTASSIUM CHLORIDE

**J. Johnson[1*], R. Srineevasan[1] and D. Sivavishnu[1]**

*[1]PG & Research Department of Physics, Government Arts College, Tiruvannamalai. 606 603, Tamilnadu, India.*
*[*]Corresponding Author: johnmad18@gmail.com, Mobile no: +919047691500*

## Abstract

Centrosymmetric semiorganic crystal 4-dimethylaminopyridine potassium chloride (4-DMAPKC) has been grown successfully by using slow evaporation solution growth technique. Powder x-ray diffraction shows the 4-DMAPKC crystal has good crystalline nature. Single crystal XRD shows that the grown 4-DMAPKC is cubic crystal system with cell parameters a = 3.09 Å, b = 3.09 Å, c = 3.09 Å. Investigation has been carried out to assign the Vibrational frequencies of the grown crystal by FTIR spectral studies. UV- Visible NIR optical absorption spectral studies in the range of 200-1100 nm shows low absorption in UV- Visible region with lower cutoff wave length at 261nm and optical band gap energy was found as $E_g$ =5.52 eV. Optically transmittance spectral shows 4-DMAPKC crystal is very good transparency in UV-Visible NIR region. Thermogravimetry and differential thermal (TG-DTA) analysis were carried out. Dielectric studies of as grown crystal sample exhibit low dielectric constant and loss at higher frequencies and attests the nonlinear optical activity. Micro hardness studies of as grown crystal were discussed. Second harmonic generation (SHG) efficiency of the 4-DMAPKC is 0.69 times as that of KDP.

**Keywords:** Centrosymmetric; Semiorganic; UV-Visible-NIR; Thermal; Electrical properties; Second harmonic generation.