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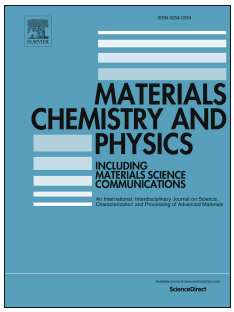

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Senthilkumar Chandran, Rajesh Paulraj, P. Ramasamy

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Effect of amaranth on dielectric, thermal and optical properties of KDP single crystal

Senthilkumar Chandran, Rajesh Paulraj*, P. Ramasamy,

Centre for Crystal Growth, Department of Physics, SSN College of Engineering, Kalavakkam, Tamilnadu- 603 110

Abstract

Bulk single crystals of pure and amaranth doped KDP were grown using point seed technique. Effect of amaranth doping on KDP crystals was analyzed using powder XRD, thermal analysis (TG/DTA), dielectric, photoconductivity and etching studies. The phase purity and crystallinity of pure and dye doped crystals were confirmed by powder X-ray diffraction analysis. It is observed from TG-DTA analysis that the decomposition point decreased while doping with amaranth. Dielectric constant and loss increases with increasing temperatures. The photoconductivity decreases with the increase of amaranth concentration.

Keywords: Impurities; Optical microscopy; Dielectric properties; Electrical properties; Thermal properties.

*Corresponding author: Tel: +91 9445434893: Fax: +91 44 27475166

Email: rajeshp@ssn.edu.in

1. Introduction

Inorganic potassium dihydrogen phosphate (KH_2PO_4) single crystal has many physical properties in several prospects of fundamental sciences and technology. The potassium dihydrogen phosphate (KDP) molecule has the ability to form a network of P–O–H···O–P hydrogen bonds, in which K^+ cations are located. They possess piezoelectric, ferroelectric, optoelectronic and