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Comprehensive study on crystal growth, optical and dielectric properties of potassium dihydrogen orthophosphate crystal influenced by organic additive salicylic acid

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Abstract

The article deals with comparative study on growth, optical (UV-visible, second harmonic generation (SHG) efficiency) and dielectric properties of pure and salicylic acid (SA) doped potassium dihydrogen orthophosphate (KDOP) crystal grown at 36 °C from slow evaporation solution growth technique. The functional groups of grown crystals have been qualitatively analyzed by means of fourier transform infrared analysis. The UV-visible studies have been carried out in the range of 200-900 nm to determine the optical transparency of grown crystals. The vital optical constants (extinction coefficient and reflectance) have been evaluated using the transmittance data to discuss the utility of grown crystal for distinct optical applications. The impact of centrosymmetric additive SA on SHG efficiency of KDOP crystal has been evaluated by means of Kurtz-Perry powder test. The dielectric constant and dielectric loss of pure and SA doped KDOP crystal has been comparatively investigated in the temperature range of 35-100 °C.

Keywords: Crystal growth, Dielectric studies, Optical studies, Nonlinear optical materials

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