Influence of Xylenol Orange Dye on Optical, Thermal, Dielectric, Laser Damage Threshold and Mechanical Properties of L-Alanine Thiourea (LATU) Single Crystals

Abstract

Bulk single crystals of pure and xylenol orange dye (XO) admixed L-Alanine Thiourea (LATU) were grown by slow evaporation technique. The cell parameters and crystallinity of pure and dye admixed LATU crystals were confirmed by single crystal, powder X-ray diffraction and high resolution X-ray diffraction analyses. The functional groups present in the crystals were confirmed by FTIR analysis. The UV-vis-NIR transmission studies show the optical transparency in the entire visible region of xylenol orange dye admixed LATU crystal. The laser damage threshold value significantly enhanced for dye admixed crystal in comparison with pure LATU crystal. The crystals were further subjected to other important characterizations such as dielectric measurement, micro hardness, thermal and NLO studies. The relative SHG efficiency of xylenol admixed LATU crystal was found to be 1.64 times higher than that of pure LATU crystal.
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**Index Terms**

Computer Science

Applied Science

**Keywords**

Slow evaporation technique powder X-ray diffraction dielectric properties nonlinear optical study.