



ChemTech

International Journal of ChemTech Research

CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.11 No.08, pp 24-31, 2018

Synthesis, Growth and Characterisation of Nonlinear Optical La-doped L-Proline Picrate Single Crystals

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Abstract : A nonlinear optical material L-Proline Picrate and Lanthanum doped L-Proline Picrate were synthesized and grown as single crystals by slow evaporation method. The grown crystals were subjected to structural, elemental, thermal, optical, mechanical and dielectric studies. The structural analysis reveals that pure LPP and La doped L-Proline Picrate belongs to the monoclinic crystallographic system with space group P_{21} . Optical transparency of the grown crystals was investigated by UV-vis-NIR spectrum. The thermal analyses reveal that La doped L-Proline Picrate is thermally stable up to 188°C. The dielectric constant and dielectric loss of the crystals were studied as a function of frequency. The nonlinear optical property of the doped crystal was confirmed by the Kurtz-powder second harmonic generation test and the result is compared with pure L-Proline Picrate. Mechanical strength of the crystals was also carried out by Vicker's micro hardness test.

Keywords : Growth from solution, Nonlinear optical crystal, X-ray diffraction, Semi organic compound, Micro hardness.

T Gurumurthi *et al* /International Journal of ChemTech Research, 2018,11(08): 24-31.

DOI= <http://dx.doi.org/10.20902/IJCTR.2018.110802>
