



ChemTech

International Journal of ChemTech Research

CODEN(USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555

Vol.11 No.05,pp01-10,2018

Investigations on optical, theoretical, mechanical and dielectric properties of newly synthesised optical single crystal - trisglycine epsomite

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Abstract: A novel, semi-organic peculiar optical crystal trisglycineepsomite (TGE) has been synthesized from aqueous solution by conventional solution growth method at room temperature. Single crystal XRD study has been carried out to categorize the crystal system and lattice parameters. PXRD study reveals the crystalline nature of the crystal. Optical spectral studies have been conducted to locate the cut-off wavelength, absorption coefficient, extinction coefficient and optical band gap of the material. The dielectric constant and dielectric loss as a function of frequency were measured. The solid state parameters of the title compound such as valence electron, plasma energy, Penn gap and Fermi energy were calculated theoretically using the empirical relation and deduced their electronic polarizability, found to be better-quality than KDP. The mechanical behaviors of TGE were studied by utilizing Vickers micro hardness tester.

Key Words: Solution growth, Optical Properties, dielectric constant, Penn analysis Vickers's hardness number.

International Journal of ChemTech Research, 2018,11(05): 01-10

DOI= <http://dx.doi.org/10.20902/IJCTR.2018.110501>
