



Structural and Dielectric studies on unidirectional growth of organic nonlinear optical single crystals of Trans-4-Hydroxy-L-Proline by Sankaranarayanan-Ramasamy method

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Abstract: An organic nonlinear optical amino acid Trans-4-Hydroxy-L-proline (HYP) a transparent uniaxial single crystal having dimension of 30 mm diameter and 50 mm length was successfully grown by Sankaranarayanan-Ramasamy (SR) method with a growth rate of 1 mm per day under ambient conditions. The grown single crystal system of HYP and lattice parameters $a = 8.31 \text{ \AA}$, $b = 4.99 \text{ \AA}$ and $c = 14.28 \text{ \AA}$ were determined from the single crystal X-ray diffraction analysis. HYP is crystallized in monoclinic phase. The crystalline perfection was evaluated using high-resolution X-ray diffractometry. Fourier Transform infrared studies confirm the various functional groups present in the grown crystal. The optical transmission of HYP crystal has transmission with its lower cut off wavelength is 210 nm. SHG measurement confirms that the HYP have nonlinear optical property and was found to be approximately equal to KDP crystal. Dielectric constant and loss factor of HYP were determined at different frequencies and temperatures.

Key words: HYP, Dielectric, HRXRD and Optical transmittance.