

## Growth and physicochemical properties of pure and urea doped sodium pentaboratedihydratesingle crystals

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**Abstract:** Pure and urea doped sodium pentaboratedihydrate (NB5) single crystals were grown by the slow evaporation of solvent technique and characterized. The grown crystals (pure + 3 urea doped) were characterized structurally and chemically by carrying out X-ray diffraction (both single crystal and powder) and Fourier transform infrared and energy dispersive X-ray absorption spectral measurements. UV-Vis spectral and second harmonic generation (SHG) efficiency measurements were carried out to characterize the grown crystals optically. The electrical characterization was carried out by AC electrical measurements by the parallel plate capacitor method at various temperatures in the range 30 - 90 °C with different frequencies in the range 100 Hz - 1 MHz. Results obtained in the present study indicate that all the grown crystals belong to the monoclinic crystal system and exhibit a normal dielectric behavior. Moreover, urea doping is found to enhance the optical transmittance, window wavelength region and SHG efficiency of NB5 crystal.

**Keywords:** single crystals, doped crystals, crystal growth, optical properties, electrical properties.

### Graphical abstract

