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# Preparation mechanism for neodymium doped strontium phosphate and its spectroscopic, optical and electrical characteristics

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**Abstract:** The growth of neodymium doped strontium phosphates (NdSrP) materials involves the system  $\text{Nd}(\text{NO}_3) - \text{SrCl}_2 - \text{H}_3\text{PO}_4 - \text{Na}_2\text{SiO}_3$ . The optimum conditions involved for the growth of NdSrP were found out. These are found to be highly efficient laser crystals with good electro-optic and conducting properties. X-ray diffraction (XRD), particle size analyzer, scanning electron microscopy (SEM), ultraviolet spectroscopy (UV), Fourier transform infrared spectroscopy (FTIR), and dielectric studies were performed to characterize the samples. The material belongs to triclinic crystal system with well defined and highly resolved crystalline peaks. The electron micrograph clearly depicts the spherulitic morphology that has further grown in the form of elongated plates. The presence of various atomic bonds within a molecule and the functional groups along with the relevant P - O bonds were found by Fourier transform infrared (FTIR) method. Ultraviolet (UV) spectroscopy is an important technique to explore the optical properties of a given material viz., electronic transitions and optical band gap. The optical transmittance range and transparency cut off depict that material possess enhanced optical characteristics. The electric analysis establishes the material to be normal dielectric and the dielectric constant is strongly temperature and frequency dependent.

**Keywords :** Electrical properties, doping, electro-optic, dielectric constant, phosphates.

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