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Influence of Mg^{2+} Dopant on the Thermal, Electrical, Spectral and Nonlinear Optical Properties of L-HistidineHydrofluoride Crystal

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Abstract:A new magnesium(Mg^{2+}) dopedL–HistidineHydrofluoride(MLHHF)semiorganic nonlinearopticalcrystalwassynthesizedandgrown by isothermalslowevaporationsolution growthtechnique. The grown crystals have been characterized by single crystal X-ray diffraction and powder X-ray diffraction analyzes. Thepresenceof functional groupsin the MLHHFcrystalwasconfirmedbyvibrationalspectroscopicanalysis.EDAX analysis confirms the incorporation of metal ion into the crystal lattice of the title compound. The lower cuf-off wavelength of MLHHF was found to be 225 nm by UV-Vis-NIR spectral studies. The nonlinear optical property of the grown crystal was affirmed by Kurtz and Perry powder SHG technique using Nd:YAG laser. Thermal properties of the MLHHF crystal were investigated using thermogravimetric(TG) and differentialthermalanalyses(DTA).The fluorescence spectrumof MLHHFcrystalwasrecorded tounderstandtheluminescence properties.The dielectric constant and dielectric loss have been measured for different frequencies and at different temperatures.Theresultsofall studies havebeen discussed in detail.

Keywords:solutiongrowth;nonlinearopticalmaterial;UV-Vis-NIRspectrum;Fluorescence; thermal properties.

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