NON-LINEAR OPTICAL PROPERTIES OF A NEW ORGANIC-INORGANIC CRYSTAL: 2-AMINO-5-NITRO-PYRIDINIUM-DIHYDROGEN-PHOSPHATE (2A5NPDP)

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ABSTRACT

Linear, quadratic nonlinear and thermooptic properties of 2A5NPDP, an organic-inorganic composite crystal are reported. 2A5NPDP was designed to display high NLO efficiency by incorporating ordered highly polarizable organic molecules in between phosphate polyanion sheets. Favourable phase matching (PM) conditions for sum frequency mixing in the 1μm region were found. Crystal nonlinear coefficients are: $d_{15} \approx 7.2 \text{ pm/V}$ and $d_{34} \approx 1.3 \text{ pm/V}$. The measured coefficients significantly depart from oriented gas model calculations based on molecular hyperpolarizability values, thus suggesting important crystal field effects and protonation contributions.