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VIBRATIONAL AND THERMAL STUDY OF L-METHIONINE NITRATE POLYCRYS TALS Victor, F.M.S.(1); Ribeiro, L.H.L.(1); Façanha Filho, P.F.(1); Santos, C.A.S.(1); Soares, R.A.(1); Abreu, D.C.(2); Sousa, J.C.F.(1); Carvalho, J.O.(2); Dos Santos, A.O.(1);

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Intensified in studies of nonlinear optical materials has been observed over the past two decades for its wide application in telecommunications, optical modulation and optical signal processing. The goal of this work is the thermal and vibrational study of L-methionine nitrate polycrystalline. The polycrystals were obtained by the method of slow evaporation of solvent at ambient temperature of 25 °C. The X-ray diffraction was performed to confirm the structure of the material, which has monoclinic structure (space group P21) with four molecules per unit cell structure. Refinement by Rietveld method has been optimized and good quality parameters Rwp = 7.97%, Rp = 5.74 and S = 1.92%. The thermal stability of the material was verified from Thermogravimetric analysis (TGA), Differential Thermal Analysis (DTA) and Differential Scanning Calorimetry (DSC). The measures showed a possible phase transition event at about 107°C before the melting point of the material, which took place at about 127°C. Thermogravimetric analysis showed two mass loss events of 61.5% and 30.4%. The vibrational modes of the L-methionine nitrate molecule were identified by Raman spectroscopy in the spectral range between 35cm-1 and 3500 cm-1, the scattering measurements were made from room temperature up to the melting temperature of the material (140 $^{\circ}$ C) in which the disappearance of bands was found in the region of normal modes at 130 $^{\circ}$ C, thus demonstrating a irreversible structural phase transition, because the spectrum obtained after returning the sample to ambient temperature is typical of amorphous material.