

PRELIMINARY X-RAY DIFFRACTION AND RAMAN SPECTROSCOPY STUDIES ON BIS(L-THREONINE) NICKEL(II) MONOHYDRATE CRYSTAL

Melo, E. B.^{1,*}; Lima Jr., J. A.²; Santos, C. C.¹; de Menezes, A. S.¹

¹ Departamento de Física, CCET, Universidade Federal do Maranhão, São Luís, MA, Brazil

² Departamento de Física, Universidade Federal do Ceará, Campus do Pici, Fortaleza-CE, Brazil

*ezequnewton@gmail.com

Copper like all metals forms coordination complexes with ligands and stable complexes with amino acids. One of those complexes is Bis(L-threonine)copper(II).H₂O (Cu(C₄H₈NO₃)₂.H₂O) that (SC₆H₉O₂N₃.HCl.H₂O) crystallizes in the monoclinic structure with 2 molecules by unit cell, space group P2₁ and cell parameters $a = 11.02(2)$ Å, $b = 4.90(1)$ Å, $c = 11.16(2)$ Å and $\beta = 93.5(5)^\circ$. In this work, we used the nickel instead of copper to grow the Bis(L-threonine)nickel(II) Monohydrate (Ni(C₄H₈NO₃)₂.H₂O). In order to obtain this crystal, 1 mol of NiCl₂.6H₂O was added to an aqueous solution with 2 mols of L-threonine. NaOH was added to this solution to obtain a solution with pH = 8. Beautiful small plate-like blue crystals were grown by slow evaporation method after keeping the temperature constant at 30°C. X-ray powder diffraction measurements of the Bis(L-threonine)nickel(II).H₂O crystal showed a pattern similar to the Bis(L-threonine)copper(II).H₂O crystal but not similar enough to perform the Rietveld refinement using the cif file of the copper crystal. To study the behavior of nickel crystal as a function of the temperature, powder X-ray diffraction measurements were carried out in a Bruker D8 Advance diffractometer using an Anton Paar temperature chamber (TTK 450). For the measurements in the range -190°C to 110°C it was observed shifts in the peaks. For the measurements above 110°C it was observed the appearing and disappearing of peaks, characterizing a structural phase transition. Raman Spectroscopy measurements at room temperature and as a function of temperature were also performed.

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