Synthesis and crystal structure of the Cu(II)-Sr(II) oxamato complexes

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Coordination polymers (CPs) are formed by self-assembly process due to weak intermolecular interactions of the nature noncovalent and coordinative bonds. In Supramolecular Coordination Chemistry a large family of ligands and metal ions use to support a rational design of CPs of increasing structural and modify physical properties.[1,2] In these work we used oxamate ligand with formula Et_2H_2mpyba where mpyba is N,N'-2,6-piridenobis(oxamate) to prepare two news coordination polymers. The preparation of Cu(II)-Sr(II) complexes of formula $[KNa_2Sr_4Cu_4(mpyba)_4(ox)(OH)(H_2O)_{20}].2,9H_2O$ **(1)** was performed by adding water solution of Cu(II) salt at basic water solution of the ligand, the result green solution of this reaction was put on one side of an H tube and on the other side of tube a water solution of Sr(II) salt and $[Sr_2Cu_3(mpyba)_2(NH_2opyba)(H_2O)_{6,75}]$ **(2)** was obtained by slow evaporation of this mixture. The characterizations were performed by elemental analysis, IR spectroscopy and X-ray diffraction on single crystal. The IR spectra showed absorption bands in the region of 4000 to 400 cm^{-1} confirming the coordination of Cu(II) to oxamato ligand. The structure of **2** consist of tricopper(II) anionic species $[Cu_3(mpyba)_2(NH_2opyba)]^{4-}$ coordinated by Sr(II) and water molecules (coordinated and non-coordinated) and structure of **1** consist of anionic unit $[Cu_2(mpyba)_2]^{4-}$ coordinated by Sr(II), Na(I), OH^-, ox^{2-} and water molecules. This methodology promoted a partial decomposition of the ligand in $[NH_2opyba]^{-2}$ and ox^{2-} species. Its structures suggests that Cu(II)-Sr(II) oxamato complex opens wide possibilities of coordination network structures to obtain the multifunctional magnetic materials.

References

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