

with $\beta = 92.602(2)^\circ$. The final R value is 0.0258 for 2795 reflection measured. The X-ray analysis shows that benzene-1,3-diamine fragment in proton transfer compound is not contribute in the molecular structure of complex. The molecular structure consists of two metal fragments linked *via* the central four membered Sn_2O_2 ring. Each of two Sn atoms is coordinated by the chelate $(\text{pydc})^{2-}$ ligand, one bridging oxygen atom of carboxylate group, two terminal methyl group and as well as by one terminal ethoxy group. Therefore, the coordination number is seven for each central atom and distorted pentagonal bipyramid geometry is observed around the tin atoms.

Keywords: crystal structures, supramolecular chemistry, weak interactions

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A structural study of metal complexes of bisphosphonate partial ester derivatives

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The chemistry of metal bisphosphonates (BPs) is a growing area of interest due to the unique properties of these compounds, including chemical and thermal stability and the possibility to manipulate their structure. Metal BPs also exhibit a variety of open frameworks such as layered and microporous structures offering a diversity of practical applications in the areas of ion-exchange, catalysis, and sorption. Clodronate, (dichloromethylene)bisphosphonate, Cl_2MBP , is one of the best-documented BPs since it is effectively used in therapeutics. We have focused on studying the complexing properties of ester derivatives of clodronate with the divalent metal cations [1-3]. We present here the crystal structures and characterization of three novel Cd complexes of phenyl esters and alkyl ester derivatives of Cl_2MBP . The structures of the complex crystals were determined by X-ray single-crystal diffraction. All three compounds are coordination polymers with a layered structure. In the case of the Cd complex of the asymmetrical alkyl ester derivative of Cl_2MBP , the layers are connected into a 3D framework through hydrogen bonds. The Cd^{2+} cations of all compounds are in an octahedral environment. However, these layered architectures are different due to the different metal/ligand ratio and different protonation degree and coordination mode of the BP anions.

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Keywords: bisphosphonate, metal complexes, crystal structures

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High pressure synthesis and analysis of new yellow emission Sr_2ZnS_3 : Eu visible-light driven phosphor

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Yellow emission phosphors, which can be excited by blue light, are actively sought for the applications in the LED based lighting. In this work we report synthesis and crystal structure of the new compound Sr_2ZnS_3 , which demonstrates strong yellow fluorescence when activated with Eu^{2+} . Mn doped Ba_2ZnS_3 material is a well-known important green emission phosphor. Recently, the Eu^{2+} activated compound also attracted much attention as a prospective red phosphor for the LED-based applications. Nevertheless, no successful report on synthesis of Sr_2ZnS_3 could be found in literature although in analogy with Ba_2ZnS_3 such a compound should have a remarkable potential as a host for development of new fluorescent materials. In this work Sr_2ZnS_3 was prepared for the first time from the individual metals sulfides under 5GPa pressure at 1000C. The composition of the material was confirmed by EDS. It has tetragonal unit cell (space group $Pbn2_1$) with $a=16.41\text{Å}$, $b=8.464\text{Å}$ and $c=4.071\text{Å}$. The crystal structure was solved *ab initio* using powder diffraction data. A series of Eu^{2+} activated phosphors was prepared from $\text{Sr}_{1-x}\text{Eu}_x\text{S}$ ($0.01 < x < 0.06$) precursors. In order to achieve homogeneous distribution of the activator, the precursors were synthesized by polymerizable complex method combined with conversion of the intermediate carbonate into sulfide by H_2S . The obtained Sr_2ZnS_3 :Eu materials demonstrated strong yellow emission, which can be excited by the near-UV and visible light, and it makes Sr_2ZnS_3 :Eu sulfide an appealing yellow phosphor for LED-based applications. Currently available samples demonstrate fluorescence intensity of 43% compared to one of the best commercial Ce^{3+} doped yttrium-aluminum garnet (YAG-P46) phosphor. The support of this work by Kakenhi grant 20900106 is acknowledged.

Keywords: phosphors, high-pressure high-temperature synthesis, *ab-initio* powder structure determination

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Designing Zn and Co based 1-D coordination polymers with possible magnetic and electronic properties

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Several coordination polymers composed of Zn and Co as metal ions and various aromatic carboxylates as ligands have been synthesized and their structures determined. Typical structures are composed of 1-D chains in which divalent metal ions (Zn or Co) form a polymeric chain surrounded by carboxylate ligands. In all cases the carboxylate ligands coordinate to two metal ions and as a consequence act as a bridge between them, with the coordination environment being tetrahedral in some structures, or a combination of tetrahedral and octahedral in others. Some examples containing oxygen as an additional bridging atom have also been synthesized. In all the structures, the neighboring chains interact with each other through C-H... π and π ... π interactions. All the structures are