

HYBRID MATERIALS BUILT FROM Cu(II) AND Ni(II) AMINE COMPLEXES AND OXOMETALLATES

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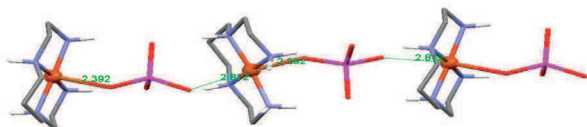
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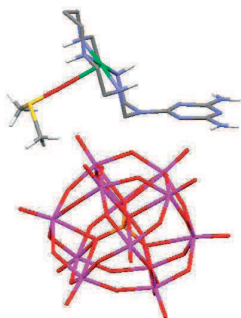
Polyoxometallate anions (POM) and composite materials thereon possess promising catalytic, magnetic and other physical properties and are nowadays the subject of numerous investigations. One of the ways to tune their characteristics consists in hybridization them with metal complexations which are able to form coordination bond(s) with nanosized POM clusters. During our search

in this direction we succeeded in preparation and structural characterization of some examples of such hybrid materials based on copper(II) and nickel(II) amine complexes.



The crystal structures of two complexes, $[\text{Cu}(2,3,2\text{-tet})(\text{XO}_4)] \cdot 2\text{H}_2\text{O}$ (2,3,2-tet=1,9-diamino-3,7-diazanonane;

X=Mo, W), were estimated by means of single crystal X-ray diffraction analysis. Despite both compounds are isostructural, the peculiarities of copper(II) - anion interaction are different. While in tungstate complex the anion is coordinated to copper in monodentate manner (Cu-O distance 2.311 Å; the closest Cu-O distance to another metal ion 3.125 Å), in molybdate it plays a bridging function (Cu-O distances 2.392 and 2.812 Å).



The interaction of the nickel(II) complex of the macrocyclic melamine-derived ligand with dodecatungstate anion in DMSO with subsequent diffusion of methanol vapor results in the formation of ionic compound $[\text{Ni}(\text{LH})(\text{DMSO})][\text{PW}_{12}\text{O}_{40}]\text{DMSO} \cdot \text{MeOH} \cdot 7\text{H}_2\text{O}$ (see figure). The same reaction but with diffusion of water vapor gives again the ionic complex $\text{K}[\text{NiL}(\text{H}_2\text{O})_2][\text{PW}_{12}\text{O}_{40}] \cdot 2\text{H}_2\text{O}$. Peculiarities of the packing and the networks of hydrogen bonds in the lattices of all complexes will be discussed in the presentation.