

Synthesis, characterization and X-ray structural studies of three hybrid inorganic–organic compounds: silver(I)-, lead(II)- and tris(phenanthroline)copper(II)- 2,6-naphthalenedisulfonate (2,6-nds).

Autorzy

Santosh Kumar
Raj Pal Sharma
Paloth Venugopalan
Julia Jezierska
Agnieszka Wojciechowska
Valeria Ferretti

Rok wydania

2015

Czasopismo

Inorganica Chimica Acta

Numer woluminu

432

Strony

221-230

DOI

10.1016/j.ica.2015.04.009

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Three new hybrid inorganic–organic compounds of silver(I), $\text{Ag}_2(2,6\text{-nds})$, **1**, lead(II), $[\text{Pb}(2,6\text{-nds})\cdot\text{H}_2\text{O}]_n$, **2** and copper(II), $[\text{Cu}(\text{phen})_3](2,6\text{-nds})\cdot 11\text{H}_2\text{O}$, **3**, have been synthesized by reacting appropriate reactants in aqueous medium. All the three compounds were characterized on the basis of elemental analyses, spectroscopic techniques (FT-IR, NMR, EPR and NIR-Vis-UV), thermogravimetric analyses and X-ray powder diffraction studies. Single crystal X-ray structure determination of compound **2** (Monoclinic, $P 2_1/c$) revealed a polymeric structure in which lead(II) is seven coordinated by six sulfonato oxygen atoms and one oxygen atom of water molecule where as compound **3** (Triclinic,) revealed the existence of discrete ions i.e. $[\text{Cu}(\text{phen})_3]^{2+}$ cation, 2,6-naphthalenedisulfonate (2,6-nds) anion and eleven water molecules of crystallization. These water molecules in wide channels show intermolecular non-covalent interactions with disulfonate anion and $[\text{Cu}(\text{phen})_3]^{2+}$ cationic layer, leading to crystal lattice stabilization. The $d-d$ bands found in diffuse-reflectance electronic spectrum arise from ${}^2\text{A}_{1g} (d_{x^2-y^2}) > {}^2\text{A}_{2g} (d_{z^2}) \approx {}^2\text{B}_{1g} (d_{xy}) > {}^2\text{B}_{2g} (d_{xy}) \approx {}^2\text{B}_{3g} (d_{yz})$ transitions. A rare resolution of copper hyperfine splitting of powder EPR spectrum is observed only at low temperature.

Słowa kluczowe

molecule, 6-nds, X-ray crystallography, Diffuse-reflectance electronic spectrum, Hyperfine splitting and non-covalent interactions

Adres publiczny

<http://dx.doi.org/10.1016/j.ica.2015.04.009>

Strona internetowa wydawcy

<http://www.elsevier.com>

Plik został wygenerowany dnia 2026-08-25 15:31:17

Adres w repozytorium <https://old.chem.uni.wroc.pl/pl/repozytorium/4k7Ni8m>.