MnO_4^- as source of manganese in the direct synthesis of heterobimetallic Cu/Mn complexes.

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Complexes $[Cu(en)_2MnCl_4] \cdot Solv$ [en = ethylenediamine, Solv = DMF (**1**), DMSO (**2**)], $[Cu(phen)_2Cl]_2[MnCl_4] \cdot DMF$ (**3**) and $[Cu(phen)_2Cl]_2[Mn(phen)Cl_3]Cl \cdot 2H_2O$ (**4**) [phen = 1,10-phenanthroline] have been synthesized by the interaction of copper metal with in DMF, DMSO or CH_3OH solutions of ethylenediamine or 1,10-phenanthroline. X-ray crystallographic studies of **1** and **2** have shown that the complexes included $[Cu(en)_2]^{2+}$ and $[MnCl_4]^{2-}$ building blocks forming zigzag chains, which originate from H-bonding of DMF or DMSO guest molecules. In the crystal structures of **3**–**4**, $[Cu(phen)_2Cl]^+$ cations and $[MnCl_4]^{2-}$ (**3**) or $[Mn(phen)Cl_3]^-$ (4) anions form 3D supramolecular frameworks through π–π stacking interactions between phen surfaces, C–H···Cl interactions and H-bonding supported by the solvent molecules. The EPR spectra of the polycrystalline compounds **1**–**3** are different as compared to spectrum for **4** due to the dominant effect of Mn(II) coordination geometry; tetrahedral in the former compounds and square pyramidal in the latter. The hyperfine splitting of frozen solution spectra indicates separation of the Mn(II) and Cu(en)2+ 2 centers under the solvents influence.

Słowa kluczowe

Heterometallic complexes, copper, manganese, X-ray crystalography, X-band EPR, Thermogravimetric analysis, FT-IR spectroscopy

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