

The first heterometallic Cu(II)/Cr(III) complex with an open-chain Schiff-base ligand self-assembled from copper powder, Reineckes salt, ethylenediamine.

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Streszczenie

A novel supramolecular assembly $[\{\text{Cu}(\text{enac})\}_2\text{Cr}(\text{NCS})_4(\text{NH}_3)_2]$ $[\text{Cr}(\text{NCS})_4(\text{NH}_3)_2]_3 \cdot 4(\text{CH}_3)_2\text{CO}$ (enac = 4,6,6-trimethyl-3,7-diazanon-3-ene-1,9-diamine), the first example of a Cu/Cr heterometallic compound containing a Schiff-base ligand such as enac, and an anion of Reineckes salt, $\text{Cr}(\text{NCS})_4(\text{NH}_3)_2^-$, as a building block, was obtained by the self-assembly reaction of copper powder and Reineckes salt in an acetone/methanol (1:4) solution of ethylenediamine in the open air. An X-ray study shows that the complex includes a trinuclear Cu_2Cr cation, constructed from two $\text{Cu}(\text{enac})^{2+}$ moieties and a *trans*- $[\text{Cr}(\text{NCS})_4(\text{NH}_3)_2]^-$ block as a two-linking bridging ligand. The metal-metal separations within the cation are $\text{Cu}\cdots\text{Cr} = 6.393(31) \text{ \AA}$ and $\text{Cu}\cdots\text{Cu} = 12.786(63) \text{ \AA}$. The supramolecular architecture of the complex involves two types of H-bonded chains, the first chain is generated by trinuclear cations $[\{\text{Cu}(\text{enac})\}_2\text{Cr}(\text{NCS})_4(\text{NH}_3)_2]^{2+}$, $[\text{Cr}(\text{NCS})_4(\text{NH}_3)_2]^-$ anions and $(\text{CH}_3)_2\text{CO}$ molecules, while the second by crystallographically different anions of Reineckes salt and $(\text{CH}_3)_2\text{CO}$. Variable-temperature (1.8–300 K) magnetic susceptibilities show a slight change of the μ_B value at low temperature, indicative of weak antiferromagnetic interactions ($J_{\text{CuCr}} = -0.9 \text{ cm}^{-1}$) between the paramagnetic centers.

Adres publiczny

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