Synthesis, crystal structure and magnetic properties of trithiocyanurate or thiodiacetate polynuclear Ni(II) and Co(II) complexes.

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Streszczenie

Three new polynuclear complexes $[Ni_2(pmdien)_2(H_2O)_2(\mu\text{-tda})](ClO_4)_2{\cdot}2H_2O$ (**1**), $[Ni_7(pmdien)_6(H_2O)_2(\mu\text{-ttc})_3](ClO_4)_5{\cdot}3H_2O$ (**2**) and $[Co_3(pmdien)_3(\mu\text{-ttc})](ClO_4)_3$ (**3**) (pmdien = *N*,*N*′,*N*″,*N*″-pentamethyldiethylenetriamine, ttc^{3-} = trithiocyanurate^{3-} anion, tda^{2-} = thiodiacetate^{2-} anion) have been prepared and characterized structurally and magnetically. The X-ray structure of heptanuclear Ni(II) complex revealed three hexa and four pentacoordinated nickel cations connected by trithiocyanuarate bridge, forming a regular Ni^{II}_7 core. The composition of **3** was determined by ESI-MS spectra and DFT calculation. Magnetic susceptibility data over the 1.8–300 K temperature range along with the magnetization data up to B = 5 T showed antiferromagnetic interactions: J/hc = −0.65 cm^{-1} for **1**; −6.1 and −6.5 cm^{-1} for **2**; −0.001 cm^{-1} for **3**. The magnetic susceptibilities of all antiferromagnetic complexes were fitted by using approximate models.

Słowa kluczowe

nickel, Cobalt, Bridging ligand, Multinuclear complexes, magnetic properties

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