

Heterobimetallische 3d-4f-Komplexe mit Bis(1,2-dithiooxalato)nickelat(II) als planarem Brückenbaustein

Heterobimetallic 3d-4f-Complexes with Bis(1,2-dithiooxalato)nickelate(II)
as Planar Bridging Block

Matthias Siebold, Alexandra Kelling, Uwe Schilde und Peter Strauch

Universität Potsdam, Institut für Chemie, PF 601553, D-14415 Potsdam

Sonderdruckanforderungen an Prof. Dr. P. Strauch. Fax: 0049 (0)331/977-5054.

E-mail: ps@chem.uni-potsdam.de

Z. Naturforsch. **60b**, 1149 – 1157 (2005); eingegangen am 24. August 2005

Planar bis(1,2-dithiooxalato)nickelates(II) react in aqueous solutions of lanthanide ions to form pentanuclear, heterobimetallic complexes of the general composition $[\{\text{Ln}(\text{H}_2\text{O})_n\}_2\text{-}\{\text{Ni}(\text{dto})_2\}_3]\cdot x\text{H}_2\text{O}$ ($\text{Ln} = \text{Y}^{3+}, \text{La}^{3+}, \text{Ce}^{3+}, \text{Pr}^{3+}, \text{Nd}^{3+}, \text{Sm}^{3+}, \text{Eu}^{3+}, \text{Gd}^{3+}, \text{Tb}^{3+}, \text{Dy}^{3+}, \text{Ho}^{3+}, \text{Er}^{3+}, \text{Tm}^{3+}, \text{Yb}^{3+}, \text{Lu}^{3+}$; $n = 4$ or 5 ; $x = 9\text{--}12$). With $[\{\text{Nd}(\text{H}_2\text{O})_5\}_2\{\text{Ni}(\text{S}_2\text{C}_2\text{O}_2)_2\}_3]\cdot x\text{H}_2\text{O}$ ($x = 10\text{--}12$) (**1**) and $[\{\text{Er}(\text{H}_2\text{O})_4\}_2\{\text{Ni}(\text{S}_2\text{C}_2\text{O}_2)_2\}_3]\cdot x\text{H}_2\text{O}$ ($x = 9\text{--}10$) (**2**) we were able to isolate two complexes of this series as single crystals, which were characterized by X-ray structure analysis. Depending on the individual ionic radii of the lanthanide ions, the compounds crystallize in two different crystal systems with the following unit cell parameters: **1**, monoclinic in $P2_1/c$ with $a = 11.3987(13)$, $b = 11.4878(8)$, $c = 20.823(2)$ Å, $\beta = 98.907(9)^\circ$ and $Z = 2$; **2**, triclinic in $P\bar{1}$ with $a = 10.5091(6)$, $b = 11.0604(6)$, $c = 11.2823(6)$ Å, $\alpha = 107.899(4)^\circ$, $\beta = 91.436(4)^\circ$, $\gamma = 112.918(4)^\circ$ and $Z = 1$. The channels and cavities appearing in the packing of the molecules are occupied by uncoordinated water molecules. High magnetic moments up to 14.65 BM./f.u. have been observed at room temperature due to the combined moments of the individual lanthanide ions.

Key words: Lanthanides, 1,2-Dithiooxalate, Crystal Structure, Nickel(II)