

HETEROTRINUCLEAR $[\text{Fe}_2^{\text{III}}\text{Ni}^{\text{II}}]$ - μ -OXO-CLUSTER BASED ON SALICYLIC ACID. SYNTHESIS, STRUCTURE AND PHYSICO-CHEMICAL PROPERTIES

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Abstract. The reaction of iron nitrate and nickel chloride with ammonium salicylate in the presence of methanol and dimethylformamide (DMF) results in the formation of a new trinuclear heterometallic complex [hexa- μ_2 -salicylato- μ_3 -oxo-(methanol) (dimethylformamide) aquadiiron(III) nickel(II)] methanol dimethylformamide (**1**). The complex **1** crystallizes in the monoclinic space group $C2/c$ and was structurally characterized by single crystal X-ray diffraction method as $[\text{Fe}_2\text{NiO}((\text{SalH})_6(\text{CH}_3\text{OH}))(\text{DMF})(\text{H}_2\text{O})]\text{DMF}\cdot\text{CH}_3\text{OH}$, where SalH denotes monodeprotonated salicylic acid ions. The IR and Mössbauer spectra and thermal properties were studied. The parameters of the Mössbauer spectrum ($\delta_{\text{Fe}} = 0.45$ mm/s, $\Delta E_Q = 1.086$ mm/s, 300 K) suggest the high-spin state of the Fe^{3+} ions ($S = 5/2$).

Keywords: heterotrinnuclear μ_3 -oxo complex, salicylate, X-ray, IR analysis, Mössbauer spectrum, TG data.