We obtained two dinuclear Nickel(II) complexes having different N₃ ligand binding type; [Ni₂-(L-Et)(N₃)(H₂O)]NO₃ NO₃ (1) (where: HL-Et=N,N,N'-N'-tetraakis[(1-ethyl-2-benzimidazolyl)methyl]-1,3-diaminopropane) and [Ni₂-(L-Et)(N₃)(H₂O)]NO₃ NO₃ (2), respectively. Complex 1 is synthesized from HL-Et, Ni(NO₃)₂·6H₂O, NaOH and NaN₃ in MeOH, indicating weak antiferromagnetic interaction. 2 is synthesized from the quite same reagent as 1 with equivalent amount but in different solvent ; EtOH, indicating strong antiferromagnetic interaction. We undertook the X-ray structural analyses of 1 and 2 to elucidate the crystal structures causing the different magnetic susceptibility.

Crystal Data: C₂₁H₂₇O₇N₉Ni₂ (1), F.W. = 1095.4, monoclinic, P₂₁/c, a = 13.751(1) Å, b = 24.356(1), c = 17.006(1) Å, β = 100.19(1)°, V = 5606(1) Å³ Z = 4, D = 1.298 g cm⁻³, λ(MoKα) = 7.39 cm⁻¹, F(000) = 2296, R (Re)= 0.089(0.119), CuKαH₂O₃Ni₂Ni (2), F.W. = 1133.5, triclinic, P-1, α = 17.112(1), β = 17.222(1), γ = 10.296(1) Å, A = 102.957(2), B = 103.413(2), γ = 64.233(1) Å, V = 2632(1) Å³, Z = 2, D = 1.430 g cm⁻³, λ(MoKα) = 7.88 cm⁻¹, F(000) = 1192, R (Re)= 0.072(0.060).

It is observed that 1 has the conformation with N₃ ligand being monodentated to one Ni atom, on the other hand, 2 has the conformation with N₃ ligand being end-to-end bridging to two Ni atoms.

**Keywords:** DINUCLEAR NICKEL COMPLEX, N₃ LIGAND, NICKEL

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**Acta Cryst.** (2002). A58 (Supplement), C132

**GEOMETRICAL PRINCIPLES IN THE CONSTRUCTION OF MOLECULAR STRUCTURES OF HETERO METALLIC ALKOXIDE COMPLEXES**

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The structures of both homo- and heterometalllic alkoxide complexes can be described in the terms of polyhedral models, including such building blocks as tetrahedra, square pyramids and octahedra. Exchange for some fragments of the structures with the geometrically but not chemically identical or geometrically equivalent fragments permits to predict the molecular structures and compositions of the new compounds. This approach permitted to envisage the existance of such new complexes as Mo₂Ta₂(O(OMe))₁₆, Mo₂M(v)₂O₅(PrP)₁₄, Re₂M(v)₂(OMe)₁₂, M(v)₂O₉(OMe)₆, M(v)₂(OMe)₆(ReO₄)₂, M(v)(O(OMe)₇(ReO₄)₂, M(ii)₂M(v)(acac)₂(OMe)₁₂, M(ii)₂M(v)₂(OMe)₁₀, M(ii)₂(OMe)₆, M(ii)(acac)₂(OPr)₄, M(ii)₂(OMe)(Oacac)₂(OPr)₄, M(ii)(M(v)₂(OPr)₁₂, M(ii)₂M(v)(O(Pr)₁₂, M(ii)₂M(v)₂(OPr)₁₂, where M(ii) = Cr, Ni; M(v) = Nb, Ta; M(vi) = Mo, W.

**Keywords:** METAL ALKOXIDES MOLECULAR STRUCTURE DESIGN POLYHEDRAL MODELS

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**Acta Cryst.** (2002). A58 (Supplement), C132

**SOLID POLYMORPHS OF HEXA-AQUA Mg(II), Co(II), AND Ni(II) HYPOPHOSPHITE**

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We are researching in the chemistry of hypophosphorous acid salts with hexa-aqua-cations of magnesium, cobalt and nickel. Crystals was grown by slow evaporation of aqueous solutions of its salts at the room temperature (T = 293K). The forms of crystals are octahedrons and hexagonal plates. Our studies have shown hexa-aqua-metals hypophosphite to exist in the form of three polymorphs, which we have termed α, β, and γ polymorphs. The structures of α- and β- [Mg(H₂O)₆(H₂PO₂)₂ (octahedrons), α-[Co(H₂O)₆(H₂PO₂)₂ (both octahedrons and hexagonal plates) and γ-[Ni(H₂O)₆(H₂PO₂)₂ (thin hexagonal plates) polymorphs have been determined by X-Ray single crystal analysis. The geometry of aqua-complexes and hypophosphite anion and the differences between the structures of polymorphs were analyzed. Packing of the metal and phosphorous atoms is the same to the structure of CaF₂. Metal atoms have the pseudo face-centered cubic cell with the parameter about 1.03 nm and the phosphorous atoms occupied the tetrahedral cavities. In all polymorphs we might find the layers formed by the H-bonding of water molecules coordinated to metal and the O-atoms of hypophosphite anion. The structures of the layers in all polymorphs are different in the way of orientation of coordinated water molecules.

**Keywords:** POLYMORPHISM, HEXA-AQUA-COMPLEXES, HYPOPHOSPHITES