

Nickel(II) Schiff base complexes: Synthesis, reactivity, magnetic properties and catalytic activity

Vladimír Kuchtanin and Peter Segľa

Faculty of Chemical and Food Technology STU in Bratislava, Radlinského 9, Bratislava 812 37, Slovakia

Schiff base ligands have been extensively studied in coordination chemistry mainly due to their facile syntheses, easily tunable steric and electronic properties as well as good solubility in common solvents [1]. Transition metal complexes with Schiff bases, which contain oxygen and nitrogen as donor atoms are of particular interest, because of their ability to possess square-planar or octahedral stereochemistry [2].

The reaction of nickel(II) acetate with tridentate *O,N,O*-chelating Schiff base (L) lead to the distorted monomeric square planar [NiLB] complexes (where B are derivatives of pyridine, piperidine, imidazole or phosphine). Some [NiLB] complexes under study were tried for their catalytic activity in Kumada cross-coupling reactions.

Five new octahedral Ni(II) complexes, namely [Ni(L)(CH)(MeOH)] · MeOH and [Ni(HL)₂(CH)] · AcN (5), were synthesized from a *O,N,O*-chelating Schiff base (L), phenanthroline or bipyridine (CH) and nickel(II) acetate, using different solvents and their ratios (MeOH and/or acetone and acetonitrile). The hypothesis with positive and negative D parameter was tested with better fit for negative alternative and weak supramolecular antiferromagnetic coupling.

The complexes under study have been characterized by spectral methods (IR, UV-VIS and NMR spectroscopy) and single crystal X-ray analysis. Using different chelating ligands (aromatic or sterical aspects) leads to tri- or tetranuclear coordination compounds with octahedrally coordinated Ni(II) centres.

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