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Investigation of substitution effect by changing from methyl to aldehyde in the highly preorganized ligand, 2,9-dicarboxaldehyde-1,10-phenanthroline, on its coordination behavior

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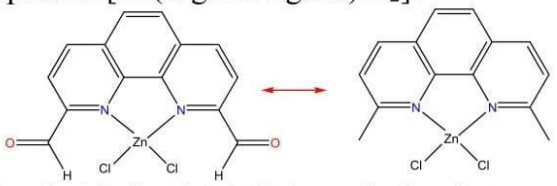
ABSTRACT

Nowadays, ligand design is an important matter in modern chemistry, biomedical, biological, environmental applications and in metal ion separations. A category of ligands that has attracted many attention, is preorganized ligand. Preorganized ligands are kinds of ligands that their conformation doesn't change during their complexation with target metal ion. These ligands have special value for metal ion in designing because of their sizes and their ideal forms. It is well known that multidentate macrocyclic or rigid ligands have greate tendency to coordinated with specific metal ions, The more preorganized the ligand is, the more stability it has. An important class of chelating ligands is based on 1,10-phenanthroline, and 2,9 positions, are in the same plane with aromatic cycles.

This work covers a chemistry of zinc complex based on neocuproine and its derivative, phenanthroline-2,9-dicarboxaldehyde, as investigation of coordination behavior of these ligands to the target metals. According to this matter, we synthesized two complexes that analysis such as IR, and CHN had shown they are isostractural. Although XRD analysis confirmed this matter. Persumably, the steric effects of the 2,9-dimethyl groups of the neocuproine with other ligands in the coordination sphere around the metal is the main reason that the pydc N-oxide is not connected to the metal ion. These evidence convinced us that both zinc complexes must be isostructural, in this pattern [Zn(organic ligand)Cl_2].



Keywords: preorganized ligands, 2,9-dimethyl-1,10-phenanthroline, isostructur.

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