

Structural Chemistry of Cyanoximes

Nick Gerasimchuk¹

¹*Chemistry, Missouri State Univ.*
nngerasimchuk@missouristate.edu

During the last three decades research chemistry of the new subclass of organic ligands – cyanoximes – that have general formula NC-C(=NOH)-R where R is an electron-withdrawing group has been developed. Presence of CN-group makes cyanoximes ~10,000 more acidic and better ligands than other known oximes. With 38 different R groups the most abundant is the family of mono-cyanoximes 1 (below), followed by bis-cyanoximes 2,3 that include aromatic and aliphatic spacers, and lately tris-cyanoxime 4 - a tripod - was obtained and characterized.

These simple low molecular weight organic molecules represent series of new excellent amplydentate ligands for coordination chemistry: new types of molecular Legos. Both un-complexed ligands, their Na^+ and K^+ salts and other metal complexes show a large spectrum of biological activity from growth regulation in plants to significant in vitro and in vivo cytotoxicity against human cancers. Currently 44 cyanoximes are known, and there were more than two hundreds cyanoxime complexes synthesized and studied using the X-ray analysis. Stereochemistry of cyanoximes ligands, their most interesting metal- and organometallic compounds are reviewed.

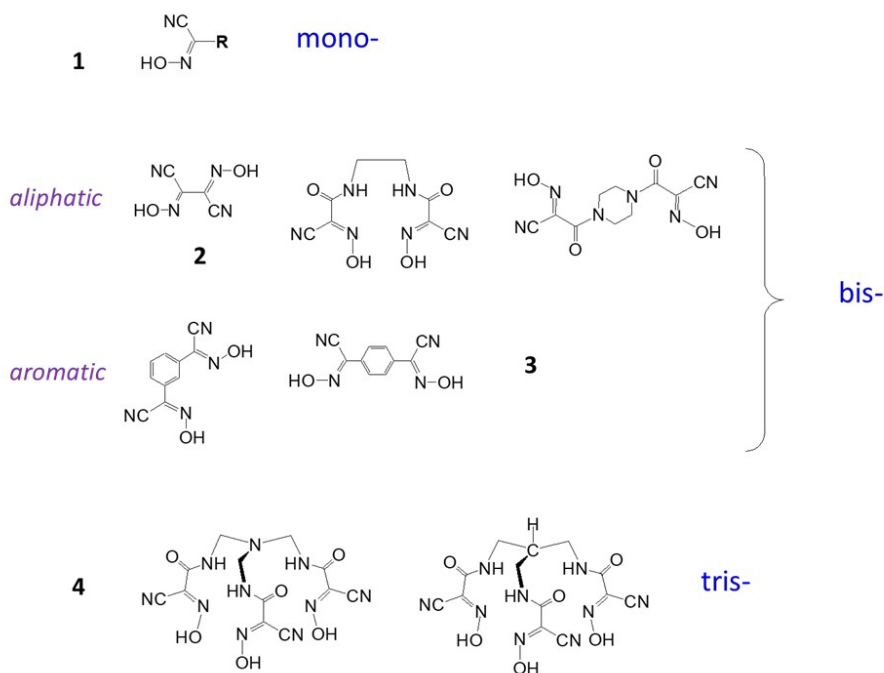


Figure 1