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The nickel, copper and zinc complexes of a potentially heptadentate nitrogen donor ligands.

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Abbreviations

Tren: tris-(2-aminoethyl)amine
L¹: tris-(2-hydroxybenzylidene)aminoethylamine
L²: tris-(2-hydroxybenzyl)aminoethylamine
L³: tris-(2-aminobenzylidene)aminoethylamine
L⁴: tris-((2-aminobenzyl)aminoethylamine)

Abstract

The synthesis of the potentially heptadentate ligands, tris-(2-aminobenzylidene)aminoethylamine (L³) and tris-(o-aminobenzyl)aminoethylamine (L⁴) are reported. Complexes of L³ with nickel copper and zinc have been synthesised and characterised. However, the nickel and zinc compounds are observed to re-arrange during the procedures used to produce samples for X-ray diffraction analysis. In both cases aniline groups are found to migrate to give rise to unique but related coordinated polyamine species. A rational route which allows for the reduction of the imine function in L³ is presented giving rise to a heptadentate ligand (L⁴) which contains primary, secondary and tertiary amines. Having removed the reactive imine function, the synthesized nickel and copper complexes follow the expected synthetic and structural pattern with the nickel complex being observed to be octahedral and the copper(II) complex five coordinate. The zinc complex is in contrast different. As observed for L³, it is possible to generate simple ZnL³ complexes but these are prone to oxidation and intramolecular cyclisation where an aniline nitrogen couples with the secondary amine to form a coordinated indazine.

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