transfer process, on going from Ni to Pt along the isoelectron series. These results are in good agreement with electrochemical data [2].

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Metal Complexes of Indolecarboxylic Acids

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Indolecarboxylic acids constitute a well-known class of plant auxins whose biological activity has been related to the formation of stable metal complexes in plant tissues [1]. To establish the nature of the metal–ligand interactions, we are presently investigating binary and ternary complexes formed by natural and synthetic auxins.

We report here preliminary results for the copper(II) complexes of indole-3-acetic acid, indole-3-propionic acid and indole-3-butanoic acid as well as for the copper(II), cobalt(II) and nickel(II) complexes of indole-2-carboxylic acid. The compounds, obtained by reaction of the appropriate acid and metal acetate in aqueous ethanol, have been characterized by means of thermal, spectroscopic and magnetic measurements.

The interaction of copper(II) with indole-3-acetic acid, indole-3-propionic acid and indole-3-butanoic acid yields green complexes having formulae $Cu(IA)_2 \cdot 2H_2O$, $Cu(IP)_2$ and $Cu(IB)_2$*, respectively. Magnetic and ESR data of the complexes are indicative of a structure of the copper(II) acetate type. Also, the solid state electronic spectra are typical of dimeric copper(II) carboxylates through *d–d* absorptions in the 14.5–15.0 kK range and bands at 25.0–26.6 kK characteristic of the bridging system [2].

The complexes of indole-2-carboxylic acid have general formula $M(IC)_2 \cdot 2H_2O$ (M = Ni, Co and Cu). Infrared spectra exclude the involvement of the indole nitrogen in the metal coordination. The electronic spectra of cobalt and nickel complexes agree with a pseudo-octahedral coordination at the metal ion and a donor set of the O_6 type. The copper(II) complex is monomeric. The ESR parameters ($g_{\parallel}$ = 2.298, $g_{\perp}$ = 2.106) and electronic data (*d–d* maximum: 14.5 kK) are consistent with a square-planar or strongly distorted tetragonal coordination involving O-donors.

On the whole, all the spectroscopic data indicate that, at least in the solid state, the ligands herein examined act as simple carboxylic acids.

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*Abbreviations: IA, IP, IB and IC denote the deprotonated forms of indole-3-acetic acid, indole-3-propionic acid, indole-3-butanoic acid and indole-2-carboxylic acid, respectively.

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