Spectroscopic Studies on Bis(3,5-di-t-butyl-1,2-benzoquinone 1-oximato)copper(II) and its Mixed-Ligand Complexes.
Copper(II)-Radical Ferromagnetic Coupling

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Mixed-Ligand Complexes, Copper(II)-Radical Ferromagnetic Coupling

Bis(3,5-di-t-butyl-1,2-benzoquinone 1-oximato)copper(II), Cu(ox)\textsubscript{2}, and its mixed-ligand complexes, Cu(ox)L\textsuperscript{x} [L\textsuperscript{x} = 8-hydroxyquinolinato (L\textsuperscript{1}), N-Phenyl-salicyldimine (L\textsuperscript{2}), N-phenyl-3,5-di-t-butyrsalicyldimino (L\textsuperscript{3}) and N-(2-hydroxyphenyl)-3,5-di-t-butyrsalicyldimino (L\textsuperscript{4})], were prepared and their spectral behavior as well as redox-reactivity towards PPh\textsubscript{3}, \((m\text{-ClC\textsubscript{6}H\textsubscript{4}})\textsubscript{3}P, (m\text{-CH\textsubscript{3}C\textsubscript{6}H\textsubscript{4}})\textsubscript{3}P and PPh\textsubscript{2}-(CH\textsubscript{2})\textsubscript{4}\text{-PPh\textsubscript{2}} studied by analytical and spectroscopic (IR, UV-vis, ESR) techniques and magnetic measurements. Cu(ox)\textsubscript{2} and Cu(ox)L\textsubscript{4} complexes prepared in air show \(\mu_\text{eff}\) values of 2.84 and 3.33 \(\mu_\text{B}\), respectively, and are consistent with an S = 1 and S = 3/2 ground states. Both compounds are formulated as copper(II)-radical complex exhibiting intramolecular ferromagnetic coupling between the orthogonal \(d_{x^2-y^2}\) magnetic orbital of the Cu\textsuperscript{II} ion and that of the \(\pi\)-radical ligand.