

Nickel(II) complexes with mixed ligands: Synthesis, WORM memory applications, and potential biological applications as anticancer and antifungal agents

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Six novel nickel(II) complexes have been synthesized using Nickel(II) nitrate hexahydrate, *ortho*-phenanthroline (*o*-phen), or 2,2'-bipyridine (bipy) and 1-cyano-1-carboethoxyethylene-2,2-dithiolate (CED²⁻) ligands in various stoichiometric ratios, showing good solubility across organic solvents. Weight loss experiments suggest water of crystallization, and molar conductance studies indicated electrolytic behavior for some complexes. UV-visible absorption spectra has confirmed octahedral coordination around Ni(II), and fluorescence studies show excitation-dependent emissions. IR has confirmed structural details, and current-voltage (I-V) measurements have demonstrated resistive switching behavior in memory devices, with compounds exhibiting write-once-read-many (WORM) characteristics. Cytotoxicity studies show noteworthy activity against the A-549 lung cancer cell line, especially for compounds **1**, **4**, and **6**. Antifungal assays have revealed notable activity against certain fungi, enhanced by the metal-ligand interaction increasing lipophilicity. These findings highlight the potential of the complexes in memory devices, anticancer treatments, and antifungal applications.

Keywords: Nickel(II) mixed ligand complexes, Dithiolates, *ortho*-Phenanthroline, Cytotoxic activity, Antifungal activity