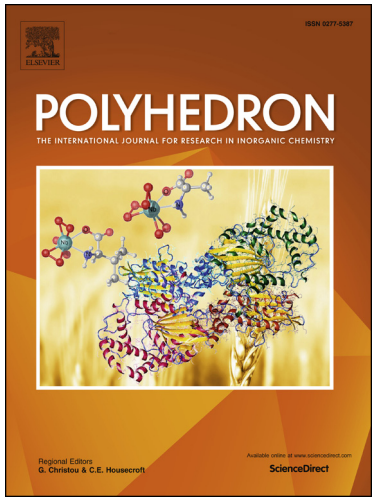

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Copper, nickel and zinc complexes of 3-acetyl coumarin thiosemicarbazone: Synthesis, characterization and *in vitro* evaluation of cytotoxicity and DNA/protein binding properties

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Abstract

A new 3-acetylcoumarin thiosemicarbazone (AcTsc) and its copper(II) (**1**), nickel(II) (**2**) and zinc(II) (**3**) complexes were synthesized and characterized by elemental analysis, UV-visible, FT-IR, ^{1}H & ^{13}C NMR / EPR and mass spectroscopic techniques. The molecular structure of AcTsc, and the complexes **1** and **3** was confirmed by single crystal X-ray crystallography. The interaction of the complexes (**1**-**3**) with calf thymus DNA (CT-DNA) and bovine serum albumin (BSA) was explored using absorption and emission spectral methods, and viscosity measurement. The spectroscopic results clearly suggested that the complexes (**1**-**3**) interacted with CT-DNA through intercalative binding mode. In addition, all the complexes were subjected to cytotoxic studies against human liver carcinoma (HepG-2), lung carcinoma (A549), human leukemic monocyte lymphoma (U937) and lymphoblastoid multiple myeloma cells (IM-9). Complex **3** showed significant cytotoxicity against human liver carcinoma (HepG-2) and lymphoblastoid multiple myeloma (IM-9) cell lines with the IC_{50} value of 25 μg/mL.

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Keywords: Copper(II); Nickel(II); Zinc(II); DNA/BSA interaction; Cytotoxicity