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Preparation and characterization of new azo ligand with transition metal complexes and pharmacological, and analytical studies.

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Abstract

Abstract

The study included the preparation and characterization of a new heterocyclic azo ligand (2-ABTAAP) derived from 2-amino-benzothiazole. A series of metal complexes were prepared with the metal ions Co(III), Ni(II), Cu(II), and Ag(I). The prepared compounds were identified by FTIR spectra, ^1H NMR, ^{13}C NMR spectra, mass spectrometry, UV-Vis spectrometry, FESEM, and XRD spectroscopy as well as elemental microanalysis (C.H.N.S). The results showed the azo ligand (2-ABTAAP) behaves as a Tridentate ligand. The molar ratio of the studied metal ions Co(III), Cu(II) and Ni(II) in their coordination complexes were determined (1:2) [M:L], and the expected shape of these complexes is octahedral. In the other hand, the Ag(I) was (1:1) [M: L] and the expected shape of these complexes were tetrahedral with ion Ag(I). Finally, the new azo ligand and its metal complexes were tested in vitro for antibacterial and antifungal activity against two types of bacteria (*Staphylococcus aureus*, *Pseudomonas aeruginosa*) and two type of fungus (*Candida auris*) and (*Candida albicans*). In addition, toxicity examinations of some compounds prepared on human cells for cancer (Bone and Brain) were studied to find out the possibility of using this type of compound as a drug by treating it with human cancer cells. Ligand and the Ag(I)-complex were studied on lung cancer cell lines (A172), and the Ni(II) complex on the pancreatic cancer cell lines (MG-63), and normal cells (HdFn), we note that the value of IC₅₀ is higher for normal cells. In contrast, in the case of cancer cell lines, the value of IC₅₀ is lower, which is given an excellent result.