

Coordination chemistry and bioactivity of some metal complexes containing two isomeric bidentate NS schiff bases derived from S-benzylthiocarbamate and the x-ray crystal structures of S-benzyl- β -N-(5-methyl-2-furylmethylene)dithiocarbamate and bis[S-benzyl- β -N-(2-furylmethylketone)dithiocarbato]cadmium(II).

Abstract

isomeric bidentate ligands having nitrogen–sulfur donor sequence were prepared by condensing S-benzylthiocarbamate (SBDTC) with 5-methyl-2-furyldehyde (NS) and 2-furylmethylketone (NS'). Complexes of these ligands with lead, tin, iron, cobalt and cadmium gave complexes of $[M(L)_2]$ (M=Pb, Fe and Cd) and $[M(L)_2]Cl_n$ (M=Sn, n=2 and Co, n=1) (L=NS and NS'). The compounds have been characterized by spectroscopic studies (infrared, 1H NMR and electronic spectra). X-ray crystallographic analysis of S-benzyl- β -N-(5-methyl-2-furylmethylene)dithiocarbamate shows the presence of two independent molecules in the asymmetric unit. The molecule adopts a trans–cis configuration, as was observed in other analogues, such as SBDTC where the furylmethylene and benzyl groups are trans and cis about the N–C and C–S bonds, respectively. The molecular structure of bis[S-benzyl- β -N-(2-furylmethylketone)dithiocarbato]cadmium(II) shows a tetrahedral geometry about the central cadmium atom with the bidentate ligand coordinating through the thioketo sulfur and the azomethine nitrogen atoms. The lead(II) complex of the NS ligand was highly cytotoxic against leukemic cells (CEM-SS) with a CD_{50} of $3.25 \mu g\ cm^{-3}$ while antimicrobial screening showed that the $[Fe(NS)_2]Cl_2 \cdot H_2O$ complex was effective against *Aspergillus* achraceous.

Keyword: Bioactivity; Cadmium(II) complexes; Crystal structures; Dithiocarbamate Schiff base crystal structures; Metal complexes; Schiff base ligands.