

Synthesis, characterization and biological activities of 3-methylbenzyl 2-(6-methylpyridin-2-ylmethylene)hydrazine carbodithioate and its transition metal complexes

ABSTRACT

A tridentate nitrogen-sulfur Schiff base, 3-methylbenzyl 2-(6-methylpyridin-2-ylmethylene)hydrazine carbodithioate (6mpyS3M), was synthesized by condensation of 6-methylpyridine-2-aldehyde with S-3-methylbenzyl dithiocarbamate. It crystallized in space group P 2₁/n. It displayed intermolecular N–HN hydrogen bonding between the α-nitrogen and the pyridyl nitrogen. The thione sulfur is in a trans position with respect to the 6-methylpyridine fragment across the C–N bond but adopts a cis position with the 3-methylbenzyl fragment through the C–S bond. Octahedral complexes containing two 6mpyS3M ligands were prepared with Cu(II), Ni(II), Zn(II) and Cd(II). 6mpyS3M and its metal complexes were assayed against selected microbes and two breast cancer cell lines. 6mpyS3M was strongly active against both cancer cell lines. Its metal complexes showed high selectivity with Cu(II), Ni(II) and Zn(II) complexes strongly active against only one of the cancer cell lines, whereas the Cd(II) complex was strongly active only against the other. Only Cu(II) and Cd(II) complexes were active against some of the bacteria.

Keyword: New dithiocarbamate ligand; Octahedral metal complexes