**ABSTRACT**

A Schiff base ligand L was synthesized by condensation of 1,2-diaminoethane with creatinine. The reaction of the ligand with metal chloride salt gives Co(II) and Cu(II) complexes. The synthesized ligand and its metal complexes were characterized by elemental analysis, FT-IR, NMR, UV–Vis, conductivity and magnetic susceptibility measurements as well as thermal analyses. Based on spectral data, tetrahedral geometries have been proposed for the Co(II) and Cu(II) complexes. The molar conductivity data show that the complexes are non-electrolytic in nature. In DFT studies, the geometry of the Schiff base ligand and its Co(II) and Cu(II) complexes were fully optimized using the B3LYP functional together with 6-31g(d,p) and LANL2DZ basis sets. The ligand and its metal complexes were tested against four bacterial species and two fungal species. The results revealed that the metal complexes are more potent against the microbes than the parent ligand.