

Abstract

The Condensation reaction of Benzamide (C_7H_7NO) with Acetophenone ($C_6H_5CCH_3$) resulted in the synthesis of a novel Schiff base ligand (SBL). The freshly prepared ligand was further reacted with transition metals M^{2+} ($M =$ Copper, Zinc, Cobalt, and Nickel) to synthesize metal complexes. The SB ligand has a tridentate coordination mode chelating with metal ions through carbonyl oxygen and the nitrogen atom of the azomethine group. The new compounds were characterized by physical properties and spectroscopic analyses (vibrational spectroscopy, photoluminescence (PL) spectroscopy including absorption and emission spectral studies, and ultraviolet-visible spectroscopy). The antibacterial potential of the complexes upon coordination with SBL has been evaluated by using the disc diffusion method against bacterial strains of *Escherichia coli* (*E.coli*), *Acetobacter Rhizopherenis* (*A.R*), *Bacillus Meurelus* (*B.M*), and *Bacillus-Subtilis* (*B.S*). The antibacterial inference of the compounds was screened by susceptibility zone measurements. To conclude the effect of chelation on transition complexes of SBL, the antioxidant effects of the SBL and complexes were screened by DPPH radical scavenging and ABTS cationic radical scavenging analyses under the ultraviolet-visible spectroscopy absorbance values.