Synthesis and Study of Schiff’s Base Ligands Derived from Reaction of Benzil with Aliphatic and Aromatic Amines and Their Metal Complexes with Cu(II), Ni(II), Cd(II), Pb(II), Pd(II), Hg(II), and VO$^{2+}$.

Abstract:
Five symmetrical Schiff base ligands [four bi-dentate and one tetradeutantate (L$_3$-L$_7$)] and two un-symmetrical bi-dentate and tri-dentate (L$_1$-L$_2$) ligands with the Nitrogen and oxygen chromophore were isolated in pure form and good yield.

The ligands were fully characterized by elemental analyses, melting point, IR, H$^1$- and $^{13}$C- NMR, and mass spectra. The Schiff bases L$_1$ and L$_2$ were successfully coordinated to Pd(II) and VO$^{2+}$ ions respectively and these complexes were characterized using elemental analyses, IR and mass spectra. The interesting result by mass spectrum of VO$^{2+}$ complex of L$_2$ shows parent peak at 524 confirming that the formula of the complex as [VOL$_2$(ac.ac.)$_2$H$_2$O] in which the complex has an octahedral geometry. The symmetrical Schiff bases (L$_3$-L$_7$) were also successfully coordinated to Nickel (II), Copper (II), Lead (II), Cadmium (II), and Mercury (II) ions to form their corresponding complexes. The total twenty five metal (II) XI Schiff base complexes of (L$_3$-L$_7$) were isolated. These complexes were characterized by elemental analyses, melting points, IR, mass spectra technique. 1H & $^{13}$C-NMR Spectra in DMSO d$_6$ for Pb, Cd, and Hg complexes show the expected number of peaks with deferent chemical shift comparing with the free ligands in the same solvent. The interesting result by mass spectrum of Ni(L$_7$)$_2$ complex compred with
L\textsuperscript{7} spectra shows parent peak at 977 confirming that the ligand L\textsuperscript{7} has lost one proton to give the desire complex in square planar geometry.