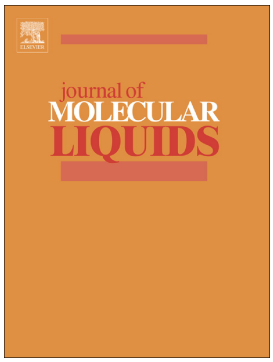

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Synthesis, spectroscopic and electrochemical characterizations of new Schiff base chelator towards Ru^{3+}, Pt^{4+} and Ir^{3+} metal ions

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Abstract

Schiff base (HL) complexes of the general formula $[M_2(L)(Cl)_x(NH_3)_y].zH_2O$ where (M= Ru^{3+}, Pt^{4+} and Ir^{3+}, L = deprotonated Schiff base of o-vanilin *p*-amino acetophenone, x=5, y=4, z= 0 for Ru^{3+} (**1**) and Ir^{3+} (**3**) and x=7, y=2, z= 3 for Pt^{4+} (**2**)) were synthesized. In ethanol, the Schiff base (HL) was prepared by refluxing o-vanilin with *p*-aminoacetophenone. Ru^{3+}, Pt^{4+} and Ir^{3+} chelates of The Schiff base coordinated to the tested metal ions (Ru^{3+}, Pt^{4+} and Ir^{3+}) in a bi-fashion through ON (phenolic oxygen and azomethine nitrogen groups) and monodentate fashion through carbonyl group oxygen of the acetophenone moiety donor systems. The resultant solid complexes were fully characterized using elemental analysis, magnetic susceptibility, molar conductivity, FT-IR, ^{1}H-NMR and electronic spectra. The complexes have octahedral configurations. The molar conductivity data indicate that the complexes are non-electrolytes. Analytical data support 2:1 (M:L) stoichiometry. The surface morphology and grain size of Schiff base complexes have been discussed using X-ray powder diffraction (XRD), Scanning electron microscopy (SEM) and transmission electron microscopy (TEM). The cyclic voltammetric analysis technique for the $[Pt_2(HL)(Cl)_7(NH_3)_2].3H_2O$ in $(Bu)_4N^+.BF_4^-$-DMSO solution at 100 mV/s vs. Ag/AgCl electrode was discussed.

Keywords: spectroscopic; electrochemistry; Ruthenium(III); platinum(IV); iridium(III), nano-particles; Schiff base; chelation.

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