

Fluorometric Detection of Nitroaromatics by fluorescent Lead Complexes: A spectroscopic assessment of detection mechanism

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Abstract:

Three Schiff base ligands such as 2-[(2-Hydroxy-3-methoxy-benzylidene)-amino]-2-hydroxymethyl-propane-1,3-diol (**HL1**), 2-[(2-Hydroxy-benzylidene)-amino]-2-hydroxymethyl-propane-1,3-diol (**HL2**), 2-[(3,5-Dichloro-2-hydroxy-benzylidene)-amino]-2-hydroxymethyl-propane-1,3-diol (**HL3**) have been synthesized by condensation of aldehydes (such as 3,5-Dichloro-2-hydroxy benzaldehyde, 2-Hydroxy-benzaldehyde, and 2-Hydroxy-3-methoxy-benzaldehyde) with Tris-(hydroxymethyl)amino methane and characterized by IR, UV-Vis and ¹H NMR spectroscopy. Then all these three ligands have been used to prepare Pb(II) complexes by reaction with lead(II) acetate tri-hydrate in methanol. In view of analytical and spectral (IR, UV-Vis and Mass) studies, it has been concluded that, except **HL2**, other two ligands form 1:1 metal complexes (**1** and **3**) with lead. Between two complexes, complex **3** is highly fluorescent and this property has been used to identify the pollutant nitroaromatics. Finally, the quenching mechanism has been established by means of spectroscopic investigation.

Key words: Schiff base ligands; Lead (II) complexes; Fluorescence; Nitroaromatics, Density functional calculation.

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