Poster Presentation

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Transition Metal complexes based chemosensor for organophosphates/ chemical warfare agents

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The one of most successful approach for sensing of organophosphate/chemical warfare agent in water is the use of metal complexes having one or more vacant coordinated sites for guest. In some cases the coordinated complexes have some labile ligands which can be selectively replaces by the specific analyte. The detection of toxic organophosphates and nerve agents such as Sarin (GB), Soman (GD), and tabun (GA) has been gained remarkable interest due to the overuse of these chemical weapons in battlefield and terrorist attacks. In literature, numerous methods have been developed for rapid detection of nerve agents such as mass spectrometry, gas chromatography, electrochemical sensors, colorimetric and fluoremeteric sensors. However, one of major drawback of reported method is that they were used in organic solvent. To overcome the solvent issue we have synthesized different metal (Ni2+, Cu2+, Zn2+) complexes of naphthalimide/ imine linked ligand for selective and sensitive detection of the organophosphate in water. The architecture of metal complexes is design in such a way that some complexes have vacant coordinated site for selective binding of organophosphates or some have labile ligands for replacement with specific analyte. The single crystal structure of all five complexes has shown that two are dinuclear and three are mononuclear with the distorted octahedral geometry. The coordination spheres of all five complexes were satisfied with chelate ligands and nitrate ions. The organophosphate recognition mechanism was studies with fluorescence and 31PNMR spectroscopy. All five metal complexes have shown nanomolar detection limit for organophosphate.

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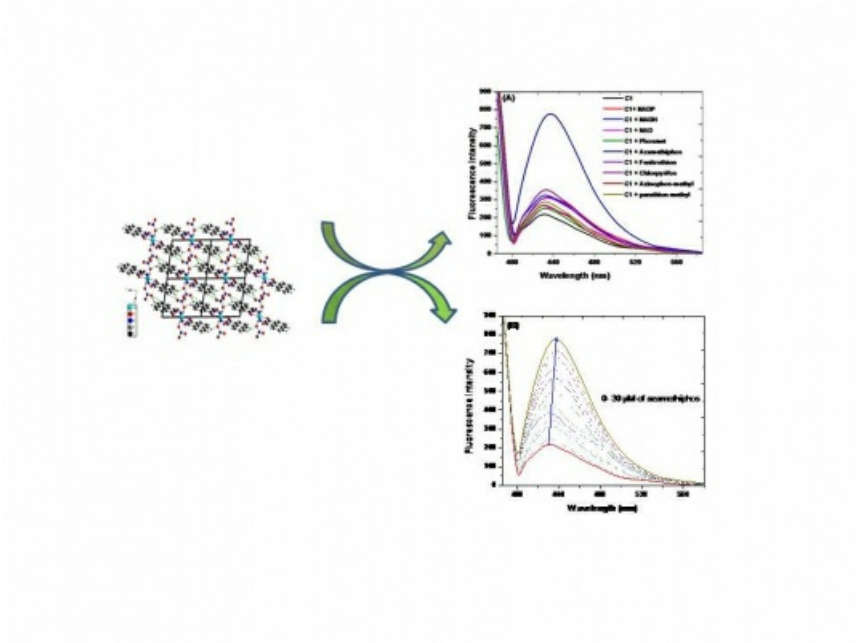

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