



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study : Ph.D.

Thesis Title: “**Structural and Photo-physical Properties of Cyclic Aromatic Imides or Anthracene Tethered to Nitrogen-Containing Rings: Sensing of Nitro-phenols**”

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SHORT ABSTRACT

Different self-assemblies of cyclic aromatic imides, anthracene and their salts and metal complexes are studied through crystal engineering approach. Properties of Cyclic Imides and anthracene derivatives as well as their different salts and metal complexes with phenolic compounds in solid state are compared with the properties observed in solution.

The content of this thesis has been divided into five chapters. Chapter 1 contains a brief discussions on pharmaceutical applications, molecular or ion recognition properties, coordination chemistry and biological activities of cyclic imide derivatives and their metal complexes. Chapter 2 demonstrates the influence of photoluminescence properties of imidazole tethered cyclic imides upon interacting with mineral acids and nitrophenols. Chapter 3 contains the recognition of organic carboxylic acids and nitrophenols by an imidazole tethered anthracene derivative in solution and solid state. Chapter 4 provides a conceptual means to detect as well as crystallize out phenolic compounds from water in presence of iron ions. Chapter 5 demonstrates the influence of π -stacking and C–H \cdots O interactions on photoluminescence of a dinuclear silver(I), a mononuclear zinc(II) and a cadmium(II) formylbenzoate complex possessing N-(4-pyridylmethyl)-1,8-naphthalimide. The thesis has improvised the scope of pre-designed non-covalent synthesis utilizing interplay of the weak interactions of cyclic aromatic imides and anthracene derivatives to generate new supramolecular assemblies with interesting optical properties in solid or solution state for molecular and ion recognitions.