



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS

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Thesis Title: "***Anthracene and Aminothiazole Based Organo-Cations Guiding Ionic-Cocrystals, Hydrates of Pyridinedicarboxylic Acids and Selected Metal Complexes***"

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SHORT ABSTRACT

The research presented in this thesis is based on the synthesis, structural characterization, and self-assemblies of salts, ionic-cocrystals and hydrates. Series of 2,6- and 3,5-pyridinedicarboxylate ionic-cocrystals were investigated to show newness in their compositions by complete or partial deprotonations. Different multi-component cocrystals with novel photoluminescence properties are demonstrated in the thesis. Multiple numbers of hydrates from different anionic cobalt(II), copper(II), and zinc(II) pyridinedicarboxylate complexes possessing anthracene-based organo-cations and their interconversions are depicted. The contribution highlights diverse non-covalent assemblies formed through weak interactions such as hydrogen bonds, halogen bonds,  $\pi$ -stacking, and chelate-chelate interactions. The study was extended to zinc(II) pyridinedicarboxylate complexes containing sulfathiazolium cations to demonstrate variations in the bioavailability of a drug molecule derived from the same components in each case but with different compositions. This thesis has opened scopes for newer avenues to explore assemblies of ionic-cocrystals as well as solvated metal complexes to observe new properties and transformations among the ionic forms within an assembly by stimuli such as concentration gradient or additives.