



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

Name of the Student : Megha Basak

Roll Number : 176122022

Programme of Study : Ph.D.

Thesis Title: Neutral Guest-Induced Assembly/Disassembly Approach for Concurrent Detection of Biologically Important Analytes under Physiological Condition

Name of Thesis Supervisor(s) : Prof. Gopal Das

Thesis Submitted to the Department/ Center : Chemistry

Date of completion of Thesis Viva-Voce Exam : 31/08/2022

Key words for description of Thesis Work : Chemosensor; neutral analytes; assembly-disassembly approach; fluorene; quinoxaline; aqueous medium

SHORT ABSTRACT

The overall thesis not only explained some important results in the field of developing advanced chemosensors for some biologically, environmentally relevant/harmful neutral analytes, but also enlightens the significant consequences in realization of assembly/disassembly prospective of certain fluorene and quinoxaline based derivatives and their stimuli-responsive fluorescence response. The cumulative studies during the research endeavour furnishes some interesting findings in aggregation/disaggregation aspect of probe molecules and insightful route in morphological transformation regarding design, synthesis and characterization of small neutral guest analytes with contrasting aggregation prospect. As mentioned in the introduction, our primary aim was to introduce sensing systems that can rapidly sense target analytes by avoiding aggregation caused quenching (ACQ) effect and introducing some assembly/disassembly triggered fluorescence responses which is conspicuous by naked eye under UV illumination; so that even an uneducated person could identify the sensing outcomes. Hence, all of the reported probes in this thesis were purposely designed to have the inherent feature of naked eye sensing ability under UV chamber. In general, the research works described in the thesis provide a clear insight of the design principle involved in developing simple organic optical chemosensor molecules (**L1- L7**) which can detect various neutral species in aqueous solution, simulated biological media and/or inside living cells. In essence, we believe that this thesis would find meaningful contribution to both analytical chemistry and supramolecular chemistry community for enhancing realization and development in the particular field of research. Hopefully, this thesis may inspire further exploration of interesting photophysical characteristics along with morphology study and sensing endeavor with this type of neutral guest molecule instructed aggregative/disaggregative nature.