List of Publications


9. Two-dimensional chromogenic sensor as well as fluorescence inverter: selective
detection of copper(II) in aqueous medium. S. Banthia and A. Samanta. New J.
Chem. (in press).

10. Multiple logical access with a single fluorophore-spacer-receptor system:
realization of inhibit (INH) logic function. S. Banthia and A. Samanta
(submitted).

11. Linear complexes of copper(I) based on 4-aminophthalimide platform: synthesis,
structure and unusual stability. S. Banthia and A. Samanta (submitted).

12. A new tiling pattern, long and short brick, comprising three-connecting nodes. S.
Banthia and A. Samanta (submitted).

13. Ratiometric fluorescent sensor for transition metal ions: A dual fluorophore
Conference presentations


Thesis Layout

The thesis has been divided into eight chapters. Chapter 1 provides a brief introduction to molecular photonics and fluorescence signaling with focus on systems based on photoinduced electron transfer (PET) mechanism. Chapter 2 provides details of the methodologies studies undertaken. The instrumental details are also presented in this chapter. Chapter 3 deals with multi-component systems comprising macrocyclic cryptand and calix[4]azacrown moieties as receptors and a 4-aminophthalimide moiety as the fluorophore component. Chapter 4 describes a simple fluorescent signaling system involving 4-aminophthalimide fluorophore and di-(2-picolyl)amine receptor that mimics several logic functions. Chapter 5 presents interesting structural features of two-coordinated linear complexes of copper(I) based on 4-aminophthalimide platform that are unusually inert towards oxidation. Chapter 6 provides the results of the investigation on a simple molecular system constructed of 4-amino-7-nitrobenzo[1,3]diazole chromophore and di-(2-picolyl)amine ionophore. This system acts as a chromogenic sensor as well as a fluorescence inverter for selective detection of cupric ions at physiological pH. Chapter 7 focuses on the photophysical and ratiometric signaling behavior of a dual-fluorophore system based on anthracene and 4-amino-7-nitrobenzo[1,3]diazole chromophores. Chapter 8 summarizes the findings of this investigation touching upon the achievements and looking into the scope of further work and upcoming challenges.