



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS

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Thesis Title: **Development of fluorescent sensors for reactive nitrogen species like nitric oxide and nitrite ion**

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**SHORT ABSTRACT**

Oxidative and nitrosative stress induced by RNS play crucial roles in a wide range of physiological processes and are also implicated in various diseases, including cancer and neurodegenerative disorders. Sensitive and selective methods for the detection of RNS based on fluorescent and luminescent probes are of great use in monitoring the in vivo production of these species and elucidating their biological functions. There are several requirements for fluorescent NO sensors to be useful in biology. Probes should be nontoxic and afford direct, fast, reversible, specific and selective NO detection. On the other hand the nitrite ion ( $\text{NO}_2^-$ ), an inorganic contaminant, is found in drinking water and is a threat to human health. When present in high concentration in human blood, it can oxidize hemoglobin and myoglobin to methemoglobin and metmyoglobin, respectively. Upon interaction with protein, it leads to the formation of carcinogenic N-nitrosoamines. Thus, a selective probe to detect  $\text{NO}_2^-$  ion would be important from various angles. So my thesis mainly focused on the design of fluorescent sensors for reactive nitrogen species like nitric oxide and nitrite ion. We have also synthesized Copper(II) complexes of N and O donor ligands and studied their Nitric Oxide (NO) reactivity.