INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study : Ph.D.

Thesis Title: **Reactivity of Cu(II) Complexes With NO_X (1, 2): Development of NO_2 Sensors**

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SHORT ABSTRACT

The thesis is mainly focused on the design, synthesis and structural investigations of Copper(II) complexes and their reactivity with Nitric Oxide (NO) as well as Nitrogen Dioxide (NO_2). Initially our aim was to mimic biological tyrosine nitration and to establish the role of Cu(II) ions. For this purpose we have synthesized multi dented ligands with nitrogen and oxygen donor sites (substituted phenols) and their copper complexes. We observed that Cu(II) ions catalyzed the phenol ring nitration by possible two ways (a) ionic mechanism through reduction of Cu(II) centre and (b) radical mechanism (Cu(II) catalysed phenoxyl radical formation).

Interestingly in some cases we found that NO_2 selectively react Cu(II) centres over NO, these results instigate us to develop the optical probes which can detect selectively NO_2 over a wide range of Reactive Nitrogen Species (**RNS**) and Reactive Oxygen Species (**ROS**). A probe which can selectively detect NO_2 would be of great importance. There is a lack of probes for selective detection of NO_2. In continuation of our research we are successful to develop some probes which can selectively detect NO_2.