



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

Name of the Student : Chiranjib Gogoi

Roll Number : 166122011

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Thesis Title: Synthesis and characterization of some Zn(II) and Zr(IV) metal-organic frameworks and their applications in fluorescence sensing and catalysis

Name of Thesis Supervisor(s) : Dr. Shyam P. Biswas

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SHORT ABSTRACT

The present thesis disseminates some of the strategies to synthesis water-stable MOFs and applies them for fluorescence sensing and catalytic application. The strategy behind the synthesis of MOFs for different applications is growing area of research within the MOF community. The inclusion of different functional sites within a single system expands the utility of MOF materials. We explored the utilization of water stable MOFs for selective detection of toxic ions like Fe^{3+} , $\text{Cr}_2\text{O}_7^{2-}$, CN^- and nitroaromatic explosives. The presence of hydrophobic cavity and also missing linker defects in metal clusters helps the researchers to explore the catalytic property of MOFs. The unique properties like high density of catalytically active sites contained within the confined nanospace allow MOFs to act as heterogeneous catalysts for many catalytic organic reactions with high efficiency and selectivity. The investigations in the present thesis disclose various aspects of research work on MOFs, which could be extended for future study. It is believed that our study will help the upcoming researchers to develop new MOF-related sensor compounds and also help to design new MOFs for catalytic study.