

**NUS Graduate School for Integrative Sciences and Engineering
Research Project Write-up**

Title of Project : Metal organic frameworks materials based on metallo-ligands

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Short Description

Coordination polymers are a varied group of crystalline coordination compounds formed by exodentate ligands linking two or more metal ions or metal aggregates. A sustained interest in structural topologies and potential applications of these coordination polymers led to identification of three-dimensional porous coordination networks (called metal-organic frameworks, MOFs) as important design targets. One of the major goals in the design and synthesis of coordination polymers is to control the size and shape of the pores. The most interesting characteristic of MOFs is their exceptional specific surface area of 1000-15000 m²g⁻¹ as compared to the conventional zeolites (~500 m²g⁻¹). This allows them to trap various gases efficiently including H₂, CH₄, CO₂, etc. in the context of energy storage and global warming. The pores can also be used to carry out catalysis in specific sites. In this project, a series of new metallo-ligands will be synthesized as ligand spacers to make the MOFs. Their reactivity, ability to store gases and catalytic properties will be explored.