

## ABSTRACT

Covalent organic frameworks (COFs) are a new class of porous organic polymers which is entirely made up of light elements (B, C, N, O, H). Unlike other organic polymers they show crystallinity and periodic pores. It has gained wide attraction due to its features such as the significant stability due to covalent bonding, great structural diversity due to the versatile combination of building units, large surface area, low density, tunable pore size etc. It has shown interesting applications in gas storage, adsorption, separation, optoelectricity, catalysis, and as functional devices. In this MS project thesis, on the topic "Design and synthesis of Novel N-Heterocyclic Covalent Organic framework (COF)", we are focusing on the synthesis of COF based on imine linkage, which can act as a surface for adsorption/separation of small molecules. To use it as a substrate for catalysis or host-guest chemistry, the pores need to be functionalised. Till now there are very few reports of post-synthetically modifying the COF through substitution reactions on pore walls. As a step forward, we have introduced a carbazole moiety which can be modified through substitution reaction methods. First chapter deals with the basic introduction of COFs, its advantages and applications. Second chapter includes the synthetic schemes we followed and the experimental procedures. In third chapter, results, conclusions and the future work that can be carried out are explained.