Jisha Joseph “Self-assembly of structurally diverse phosphomolybdates: synthesis, structure and properties.” Thesis. Research and Post gradute Department of Chemistry, St. Thomas college (autonomous), University of Calicut, 2020.

PMO based solids represent a unique class of solids by virtue of their structure and properties. There are various factors which affect the formation of these type solids with a particular structure; such as the molar ratio of Mo: metal: ligand, pH and temperature conditions. By varying these conditions structurally diverse PMOs can be formed. Diversification in the size, composition and structure of PMOs has led to significant properties and consequently numerous applications. PMOs exhibit luminescent, unusual magnetic, catalytic and electrochemical properties. On account of these properties they have found applications in various fields including biological and medical fields.

In this present study, we have made an attempt to synthesize novel PMO solids and to explore their properties. The main techniques used were solvent evaporation technique and hydrothermal method. The structural features like supramolecular isomerism, formation of water cluster and porosity have also been illustrated. The non-bonding interactions between the organic cations and the Strandberg anion resulted in the formation of multi-dimensional solids. Comparative studies of the changes in optical band gap energy based on the difference in protonation of the cluster anion and difference in the type of ligands have been done successfully. The electrochemical behaviour of two isomeric ligands based Strandberg type PMOs was investigated by using cyclic voltammetry. Besides Strandberg type solids, a rare Cu based Keggin type solid has been synthesized and characterised. The Keggin type PMO, APM has been synthesized and its dye removal efficiency has been explored. Moreover, two polymer composites of APM were prepared with an account of their properties.

However, the poor solubility and coordinating property of some organic ligands and inefficiency to control pH raise challenges in the engineering of desirable products. Yet,

the possibility of forming a wide range of self-assembled topology attracts the attention of researchers.