

## ABSTRACT

Calixarene are macro-cyclic molecules which are synthesized for monomers and dimers of Bis(hydroxymethyl)-4-methylphenol and Bis(hydroxymethyl)-*p-tert*-butylphenol. Metal-Organic Frameworks are crystalline compounds consisting of metal ions or clusters coordinated to often rigid organic molecules to form one-, two-, or three-dimensional structures that can be porous. In some cases, the pores are stable to elimination of the guest molecules (often solvents) and can be used for the storage of gases such as hydrogen and carbon dioxide. Bis(hydroxymethyl) phenol Oligomers serve as Ligands were coordinated with different transition metals (La, Ce, Sm, Cu, Ni, Cd etc ) to obtain metal-organic frameworks without and with the help of *N* containing Co-ligands. Azacalixarene were obtained by refluxing in Xylene when reaction proceeded with *N* containing Co-ligands. Few Metal-Organic complexes were obtained.