MOFs as Natural Gas Storage Materials

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ABSTRACT

The need for alternative fuels is greater now than ever. Therefore, natural gas is promising fuel source due to their availability and low contamination factor, which make it a natural choice as a substitute for oil in cars and other mobile applications. However, due to the lack of efficient storage methods it has not been fully implemented in the automotive industry. Advanced porous materials, such as metal-organic frameworks, have been explored as methane storage systems due to their exceptionally high surface areas and chemically tunable structures. MOFs are infinite networks formed by metal units (isolated atoms or clusters) that are joined together by at least di-coordinated organic ligands. The strong metal-ligand bonds provide a great mechanical and thermal stability, and a well-defined crystal structure. The structural versatility nature and composition of the MOFs opens a new possibility of controlling the chemical properties of the functional groups as well as the geometry and dimensions of the pores, channels and windows of the structure, making them an interesting alternative to the specific adsorption of gases. Therefore, in this work will be shown the preliminary results of the solvothermal synthesis of Zn- 1,4-bencenodicarboxilato which will be tested as a methane storage materials.

Keywords: metal-organic materials (MOF), adsorption, methane, affinity, porosity, Nanostructures.