

## Kinetic Separation of Ethane/Propane with pore-partitioned MOF

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The metal organic framework (MOF) is highly porous and has flexible structure. Through their intrinsic properties, MOF can be applied in the field of separation. In this work, Magnesium-MOF-74 (Mg-MOF-74) is used as adsorbent material. The Mg-MOF-74 has one-dimensional channel with pore diameter around 1.1nm. Its pore size is too large to separate light hydrocarbon molecules. 2,4,6-Tri(4-pyridyl)-1,3,5-triazine (tpt) can be partitioned into the pore of Mg-MOF-74, through the interaction between the lone pair electron of nitrogen atom of tpt ligand and open metal site of magnesium. Ligand partitioned Mg-MOF-74 will be characterized through Powder X-ray Diffraction (PXRD) and Mass spectrometry (MS) method. The 77K N<sub>2</sub> adsorption isotherm data analysis are used to characterize the pore structure of pristine Mg-MOF-74 with ligand inserted Mg-MOF-74. In order to test the kinetic separation performance of ethane (C<sub>2</sub>) and propane (C<sub>3</sub>) gas, pressure decaying curve is obtained and analyzed through several apparatus. Diffusivity of C<sub>2</sub> and C<sub>3</sub> gas will be calculated by Fickian diffusion model. Diffusion selectivity and sorption selectivity will be calculated based on the data.