

Microporous Metal-Organic Framework Materials for Sensing and Separation of Gas or Solvent Molecules

The present invention introduces a novel metal-organic framework (MOF) and a novel mixed metal-organic framework (M'MOF) for selective gas storage, selective gas sorption and/or separation, selective sensing of chemicals, and catalysis.

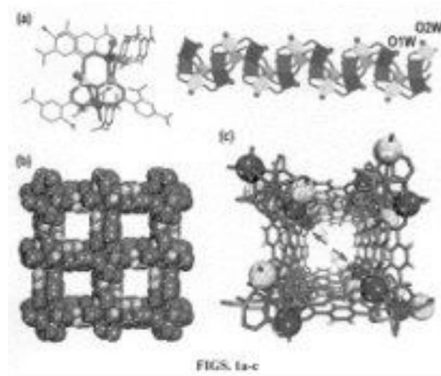
Problem

Although thousands of MOFs and M'MOFs have been synthesized and structurally characterized over the past few decades, very few MOFs have been shown to be useful for selective sorption, separation and/or sensing of guest molecules.

Solution

This invention offers superior methods for gas separation by introducing a novel rod packing microporous MOF with repeating unit $Zn_4(OH)_2(1,2,4\text{-BTC})_2$ which uses open metal sites and a novel M'MOF with repeat unit $Zn_3(BDC)_3[Cu(\text{SalPyCy})]$ or $Zn_3(CDC)_3[Cu(\text{SalPyCy})]$ with chiral pores/pockets.

Structure of microporous metal organic frameworks



Value Proposition

These technologies presents MOFs exhibits highly selective sorption and separation of gases due to their unique micropore features.

Competitive Advantages

- High capacities & efficient separation and removal of acetylene/ethylene
- Specific recognition and separation of small molecules
- Unique, temperature dependent gas separation capabilities
- Unique sorption isotherms and the highly selective sorption behaviors
- Potential for the reduced cost of production of highly porous metal-organic materials

Status of Development

- Seeking commercial partners

IP Status

- Patent US8507406B2, US9296773B2
- Licensing available