

## **Metal Organic Framework : MOF**

## **Porous Coordination Polymer : PCP**

**Metal Organic Framework (Porous Coordination Polymer) is the porous materials obtained by self-assembling metal ion and organic ligands. By bridging metal ion and organic ligand at bonding part, framework structure is built. The cavity which is built in this framework can act as the space for molecule uptake parts. Therefore, MOF (PCP) is the porous material with very large surface area (1000 – 10000 m<sup>2</sup>/g).**

**The already existing porous materials such as zeolites and activated carbon are used as the catalyst, separation materials, purifying and deodorant of water. These porous materials are so essential and they are indispensable to our lives. However, it is not possible to precisely finely modify the structure and size of these porous parts in nano meter size level. This fact impedes the possibility of porous materials to further develop to possess high and multi functions as the future materials.**

**In this regard, metal organic framework (MOF) can exhibits the very complex structure and high dimension function by incorporating the rigid concept of coordination bonding in their molecular structure. Especially by utilizing the metal complex, materials with new concepts such as porous materials and nano sized capsules can be created which can break through the boundaries between organic and inorganic materials.**

**Therefore, it is even possible to modify and control the porous structure in nano meter scale level (2-50 nm in range) which was never possible in the materials existed so far.**

**Metal organic frameworks (MOF) have the possibility to do**

- 1. Gas separation (H<sub>2</sub>, methane, CO<sub>2</sub>)**
- 2. Choose and storage of ion and molecule, separation (separation of isomer, p-xylene, m-xylene, ethyl benzene etc...)**
- 3. Solid catalyst (oxidation, addition, hydrogenation reactions...)**
- 4. Controlled gas release**
- 5. Separation and transportation**
- 6. Nano sized synthetic vessel**
- 7. Electrolyte**
- 8. Sensor**
- 9. Water, water vapour adsorption, desorption**

**Various kinds of functionality can be expected with metal organic framework (MOF).**

**GS MOF ZIF-8**

**GS MOF Mil 100 (Fe)**

**GS MOF Cu-BTC**

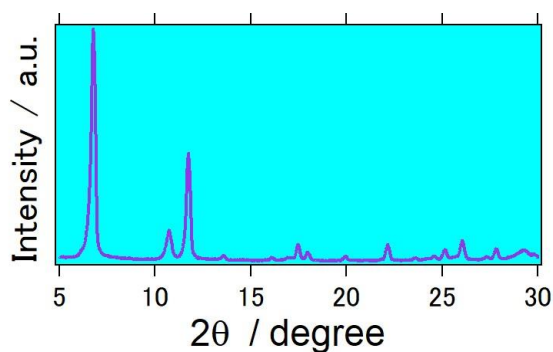
**GS MOF-801 [Zr<sub>6</sub>O<sub>4</sub>(OH)<sub>4</sub>(fumarate)<sub>6</sub>**

**GS MOF Cu - 74**

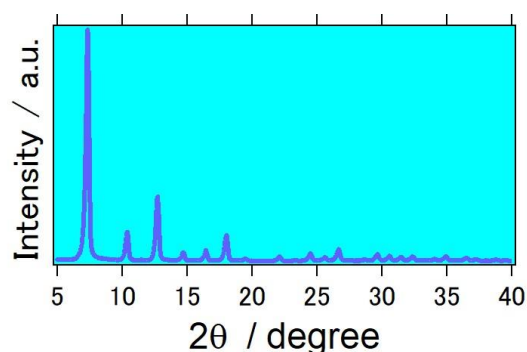
**GS MOF Ni - 74**

**GS MOF Cr-101**

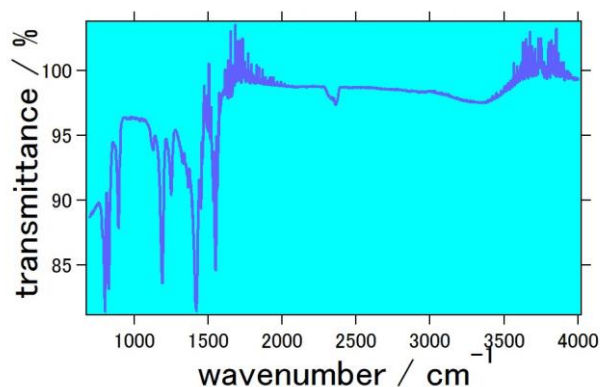
**We will further try to synthesis various types of MOF. We also accept custom synthesis as requested besides above MOF. Below presents physical and chemical properties of synthesized MOF. We will also challenge to improve catalytic activity of MOF derived catalyst for PEFC (Polymer Electrolyte Fuel Cell). Please consult with us including technical detail anytime.**



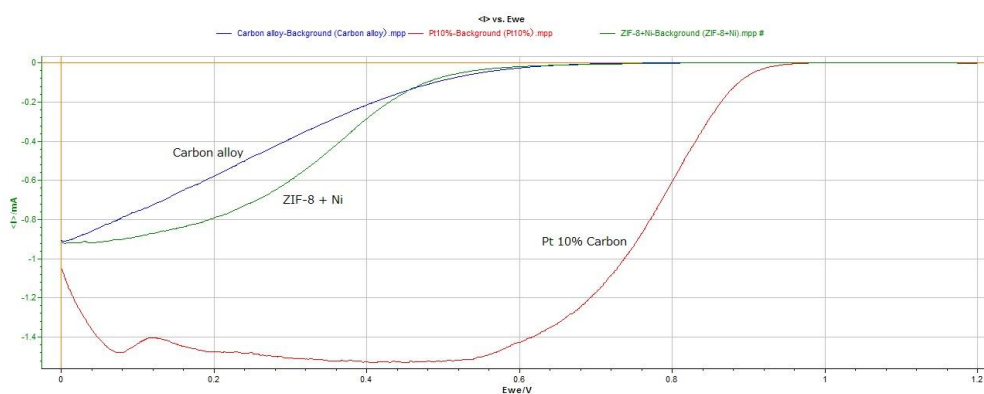
XRD of GS MOF Cu-74



XRD of GS MOF ZIF-8



FT-IR spectrum of  
GS MOF Cu-74



**Catalytic activity of Rotation disk electrode.  
(from above, carbon alloy type catalyst, MOF  
derived catalyst, Pt loaded carbon catalyst)**