

What is a MOF

The need for rules and definitions of what things are, and are not, is sometimes dismissed by the colloquial phrase "I know one when I see one". This is not good enough for science, we need to be precise but without being rigid. There are many reasons for this, and a multinational IUPAC task group has discussed Metal-Organic Frameworks at some length in this respect.^[1]

After discussions and consultations with hundreds of scientists in the area, the chemical community, through IUPAC, has now agreed on the following definitions^[2]:

Metal-Organic Framework

"A Metal-Organic Framework, abbreviated to MOF, is a Coordination Network with organic ligands containing potential voids."^[2]

Coordination Network

"A coordination compound extending, through repeating coordination entities, in 1 dimension, but with cross-links between two or more individual chains, loops or spiro-links, or a coordination compound extending through repeating coordination entities in 2 or 3 dimensions."^[2]

And the IUPAC Red Book (Nomenclature of inorganic chemistry, IUPAC recommendations 2005) defines "coordination entity" thus.

"A coordination entity is an ion or neutral molecule that is composed of a central atom, usually that of a metal, to which is attached a surrounding array of atoms or groups of atoms, each of which is called a ligand"^[3]

MOFs are therefore a subclass of the group of substances called Coordination Polymers. Note that Porous Coordination Polymers thus are MOFs but with the additional condition that porosity needs to be proven.

Two other things from the IUPAC recommendations should also be noted: There is no need for further abbreviations in the area but the use of topology descriptors is strongly encouraged.

Finally, we should perhaps remind ourselves that what matters, or should matter, in the real world are the properties of our materials not what we chose to call them. As Juliet says: "A rose by any other name would smell as sweet".^[4]

[1] S. R. Batten, N. R. Champness, X. M. Chen, J. Garcia-Martinez, S. Kitagawa, L. Öhrström, M. O'Keeffe, M. P. Suh, J. Reedijk, *Crystengcomm* **2012**, *14*, 3001-3004.

<http://pubs.rsc.org/en/Content/ArticleLanding/2012/CE/c2ce06488j#!divAbstract>

[2] S. R. Batten, N. R. Champness, X. M. Chen, J. Garcia-Martinez, S. Kitagawa, L. Öhrström, M. O'Keeffe, M. P. Suh, J. Reedijk, *Pure and Appl. Chem.* **2013**, *85*, 1715-1724.

<http://pac.iupac.org/publications/pac/pdf/2013/pdf/8508x1715.pdf>

[3] Nomenclature of inorganic chemistry, IUPAC recommendations 2005, N. G. Connelly, T. Damhus, R. M. Hartshorn, A. T. Hutton, International Union of Pure and Applied

http://www.iupac.org/nc/home/publications/iupac-books/books-db/book-details.html?tx_wfqbe_pi1%5Bbookid%5D=5Chemistry by The Royal Society of Chemistry, Cambridge, **2005**.

[4] W. Shakespeare, *Romeo and Juliet*, **1597**.