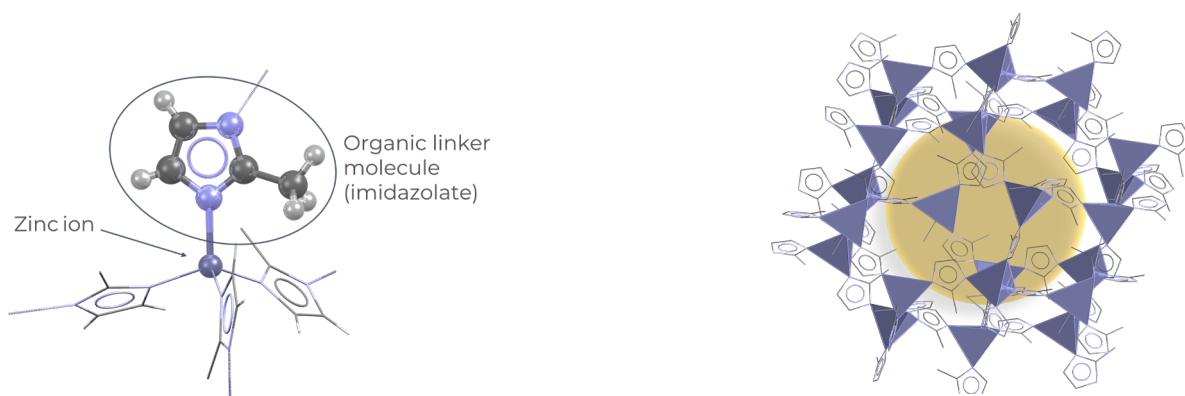
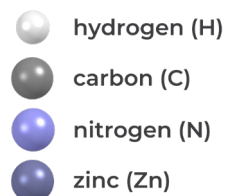


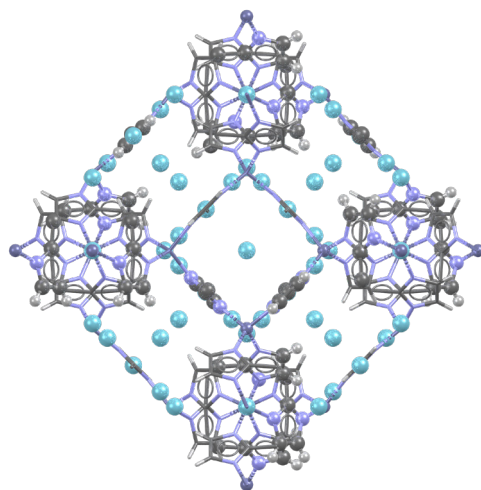
Inside Metal-Organic Frameworks

A Metal-Organic Framework (MOF) is a type of coordination structure, which means that there are **metal ions bonded to organic molecules** that are able to link between the metal ions. Each metal ion can bond to several of these linkers with the result that a **network** builds up. Sometimes, these networks can imitate naturally occurring structures and at other times they can create previously unknown arrangements. You can see an example for a MOF called **ZIF-8** below, where zinc ions are linked by nitrogen-containing organic molecules. The space between the metal ions can be quite big and often this leads to large amounts of empty space. We call pockets of empty space in crystal structures **pores**. Pores can accommodate molecules from external sources and sometimes only specific molecules can fit in them. This leads to exciting applications such as catalysis, gas storage/separation, drug delivery and carbon capture amongst other things.



ZIF-8(zeolitic imidazolate framework, CSD entry FAWCEN) is composed of zinc ions (Zn^{2+}) bonded to four organic ligands (imidazolate ions). Each organic molecule bonds to two zinc ions, building up a network. Inside this framework there is a large pore, shown as a yellow sphere.





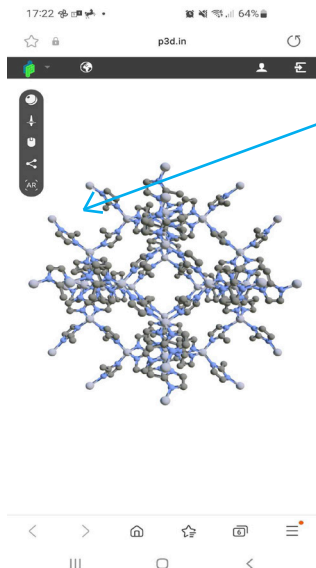
- hydrogen (H)
- carbon (C)
- nitrogen (N)
- zinc (Zn)
- argon (Ar)

ZIF-8 can absorb gases such as argon and it is able to separate gases such as hydrogen and carbon dioxide very effectively.

Augmented Reality MOF Visualization

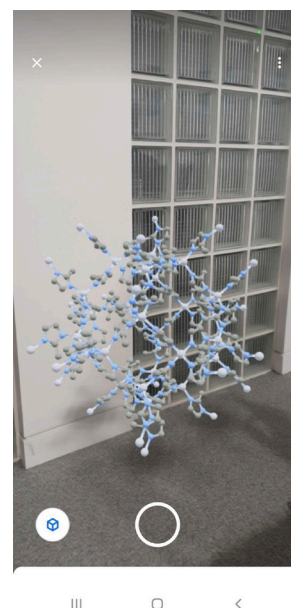
Follow the steps to view a selection of MOFs in augmented reality:

1- Scan a QR code from the sheet (the QR code to the right is for **ZIF-8**).



AR

2- In the visualiser press the [AR] button.



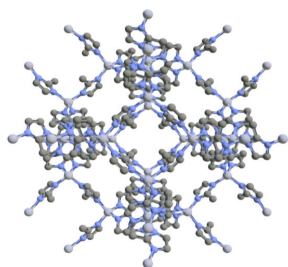
3- Follow the on-screen instructions to calibrate your phone and explore the MOF.



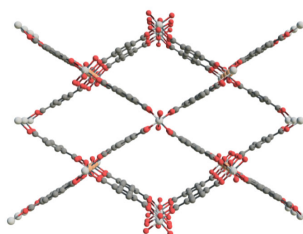
Caution: please take care not to lose your grip on reality and fall over.

Find out more about viewing MOFs in Augmented Reality in *J. Chem. Inf. Model.* 2023, 63, 5950–5955. DOI: [10.1021/acs.jcim.3c01190](https://doi.org/10.1021/acs.jcim.3c01190).

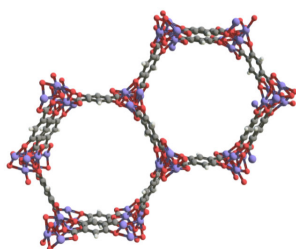
Augmented reality MOFs.



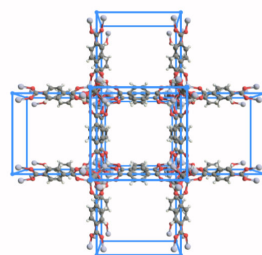
ZIF-8 (FAWCEN)



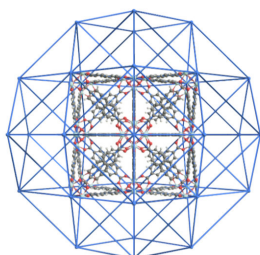
MIL-53 (ASOHUL)



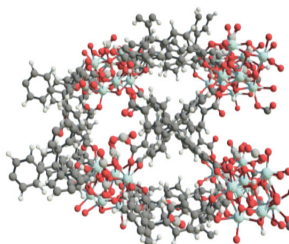
CPO-27-Co (MOHGEY)



IRMOF-1 (SAHYIK)

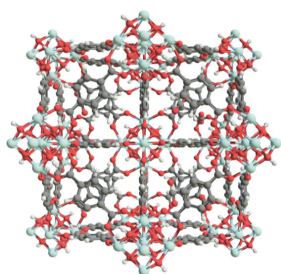


UiO-67(WIZMAV)

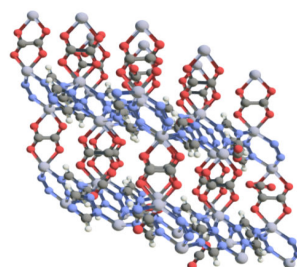


MOF-812 (BOHWOM)

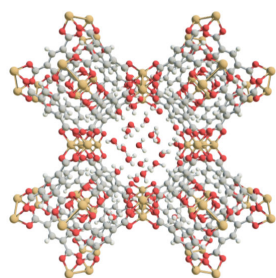
Augmented reality MOFs.



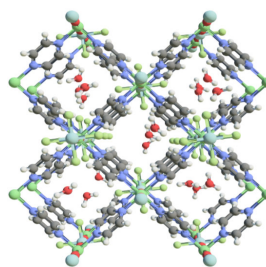
UiO-66 (RUBTAK)



CALF-20 (TASYAR)



HKUST-1 (FIQCEN)



KAUST-7 (REDQUQ)