MS30-2-3 Graphene Oxide as a Structural Directing Agent of MOFs
#MS30-2-3

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Abstract
Due to their huge surface areas, topological diversity, and functional tunability, MOFs have sparked a high interest for different applications including gas storage/separation, catalysis, sensing or biomedicine **[1]**. However, these porous hybrid materials are mostly obtained in the form of a polycrystalline powder or spherical nanospheres. One of the main challenges for their practical application is to control the crystal size, morphology and multiscale porosity of these materials while developing adequate shaping methods. For that purpose, one of the strategies reported in literature consists of combining MOFs with different carbon-based materials (polymers, graphene, carbon nanotubes, ...) **[2]**. A recent work investigated the use of GO nanoscrolls as structure directing agents to form single crystal aluminium based MOF nanowires (NWs) **[3]**. Following this approach, it was possible to obtain hierarchical porous MOF/GO composites with a specific microstructure that allowed a homogeneous dispersion of MOF NWs in the GO matrix, without any agglomeration of MOF NPs or restacked GO layers (Figure 1.). Hence, throughout this PhD project, we were able to extend this concept to another aluminium based MOF with a higher permanent porosity. Furthermore, through certain experimental conditions, a solvent-induced flexibility behaviour was observed for these single crystal MOF nanowires. In this communication, we will present the synthesis optimization of this MOF/GO composite, their microstructural characterization by advanced techniques and their solvent induced flexibility behaviour.

References
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Formation mechanism of single crystal MIL69(Al) NW