Synthesis of Metal Organic Framework Composites for Improved Porosity

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Synthesis of Metal Organic Framework Composites for Improved Porosity

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The synthesis of new highly porous composite materials, by combining Metal Organic Frameworks (MOFs) and graphene derivatives is described. The porosity of these composite materials is confirmed by pore volume, nitrogen uptake, BET and Langmuir surface area calculations. Structural information for the composites is accomplished through powder x-ray diffraction measurements, thermal gravimetric analysis and scanning electron microscopy. MOF-210, reported by Yaghi et al. in 2010, was chosen for composition with a graphene oxide composite due to its record holding pore size and internal surface area. The synthetic route to creation of precursors for MOF-210, as well as MOF-210 synthesis, is described here. Method for synthesis of graphene oxide / MOF composites used here was based on similar work by Bandosz et al. in 2009. Composite materials, such as those discussed here, have shown increased porosity and well defined structures. Here also novel MOF structures, with potential for mesoporosity, for use in composite materials are proposed.