A novel Mg-based MOF with open metal sites and its gas adsorption properties

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Metal-organic frameworks (MOFs) are a new class of nanoporous materials that have gained much attention due to their extremely large surface areas and tailorable pore structures and functionalities. Compared to MOFs containing transition metals, those containing alkaline earth metals, specially Mg-based MOFs, are relatively small. The use of lightweight Mg is of particular interest due to its less toxicity than the transition metals. In this study, we have synthesized a new 3-D Mg(II)-based MOF (1) containing coordinated DEF molecules. Heating 1 up to 400°C provides DEF-free MOF (3) with open metal sites, resulting in large H_2 and CO_2 uptakes and CO_2/N_2 selectivity.

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