

Synthesis of Metal-Organic Frameworks for the Sequestration of CO₂

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A new class of metal-organic frameworks (MOFs) based on azole functionalized linkers is being studied. It has been shown in ionic liquids that azolates will reversibly bind CO₂ to form carbamates, thus increasing the ionic liquid's ability to uptake CO₂. These results inspired the study of azolate functionalities in MOFs. Early attempts to synthesize these frameworks have led to crystallographic characterization of several novel materials. The characterized materials range from 1-D ribbons to 3-D MOFs composed of main group metals, 1st and 2nd row transition metals, or f-block metals. The linking molecules are imidazole or pyrazole based carboxylic acids. The synthesis of these materials presents a number of challenges due to the strict criteria that need to be met in order for the materials to be active in CO₂ sequestration.