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- (54) **MOF SYNTHESIS METHOD**
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- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 950 days.

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 - (52) **U.S. Cl.** **556/110**; 556/118; 556/138; 549/3; 549/206; 546/2; 534/16; 204/157.75
 - (58) **Field of Classification Search** 204/157.75; 534/16; 546/2; 556/110, 118, 138; 549/3, 549/206; 540/140
- See application file for complete search history.

(57) **ABSTRACT**

A rapid, simple and versatile metal organic framework molecule (MOF) synthesis method particularly adapted to make non-linear MOFs includes heating MOF precursors, such as a metal or metal oxide and an organic ligand, in a microwave oven for a period sufficient to achieve crystallization. Microwave-assisted MOF synthesis yields high quality MOF crystals in a reaction time ranging from about 5 seconds to about 2.5 minutes, compared to hours and days required in conventional solvothermal and hydrothermal methods. In addition, microwave assisted methods provide MOF materials with uniform crystal size and well-defined shape. Further, microwave synthesis of MOFs allows the size and shape of MOF crystals to be tailored for use in a wide range applications by manipulating reaction conditions. Secondary growth processes may also be employed to grow larger crystals using seeds obtained from microwave-assisted synthesis methods.

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25 Claims, 9 Drawing Sheets

