EXCEPTIONAL ZEOLITIC IMIDAZOLATE FRAMEWORKS AND A GENERAL STRATEGY TO MAKE MORE

Tech ID: 25486 / UC Case 2016-049-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,821,417	11/03/2020	2016-049

BRIEF DESCRIPTION

This invention discloses a new class of materials known as Zeolitic Imidazolate Frameworks (ZIFs). These multivariant ZIFs are composed of transition metal ions (such as Zn or Co) connected by imidazolate linkers in a tetrahedral arrangement, forming three-dimensional crystalline structures. The invention includes methods for synthesizing these ZIFs, enabling precise control over their structural properties, and explores their use in various advanced applications.

SUGGESTED USES

- Gas Separation and Storage: ZIFs can selectively adsorb gases like CO_2, CH_4, H_2, and noble gases, making them ideal for efficient gas separation and storage.
- Catalysis: The unique structure of ZIFs can be tailored to enhance catalytic activity, offering improved performance in chemical reactions.
- Light Harvesting: ZIFs can be used in photovoltaic devices and other light-harvesting applications due to their ability to organize light-absorbing molecules in a precise manner.
- Meta-materials: The ordered superlattices can be utilized to create meta-materials with unique optical, electromagnetic, and mechanical properties.
- Chemical Sensing: Enhanced surface area and selective pore environments make ZIFs suitable for detecting various analytes.

ADVANTAGES

- Programmable Functionality: Integration of distinct ZIF types in a single material allows for multiple, co-localized functions.
- High Surface Area and Porosity: Maintains intrinsic ZIF characteristics while introducing long-range order.
- Enhanced Selectivity and Performance: Synergistic effects between ZIF domains improve adsorption, catalysis, and sensing.
- Scalable Synthesis Methods: Compatible with bottom-up fabrication techniques and modular assembly.

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OTHER INFORMATION

CATEGORIZED AS

» **Energy**

» Other

» **Materials & Chemicals**

» Chemicals

RELATED CASES

2016-049-0

- Tailored Optical and Electronic Properties: Superlattice ordering enables design of materials with tunable photonic or electronic responses.

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Coordinative Alignment Of Molecules In Chiral Metal Organic Frameworks
- Hydroxamate-Based Metal-Organic Frameworks
- Mof Heterolites: Mesoscopic Heterogeneity Within Order With Porous Nanocrystals
- Coumarin-Linked Covalent Organic Frameworks

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