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(57) Abstract :
ABSTRACT OF THE INVENTION: . Title: A POROUS AND STABLE IMINE FUNCTIONALIZED 3D ZIRCONIUM OXYCLUSTER METAL-ORGANIC FRAMEWORK This invention discloses a porous, and stable Zirconium Metal-Organic Framework (Zr-MOF), synthesized using a uniquely designed imine-functionalized dicarbdxylic acid linker via a solvothermal method. The framework, characterized by a stable zirconium oxycluster structure and an innovative Schiff-base linker 4,4'-((l E,l'E)-((6- oxo-3,6-dihydropyrimidinc-2,4-diyl) bis (azaneylylidene)) bis (methaneylylidenen dibenzoic acid (HAMDB) which overcomes the limitations of traditional MOFs, including susceptibility to moisture and other environmental conditions. HAMDB, synthesized from 4-carboxybenzaldehyde and 2,4-diamino-6-hydroxy pyrimidine, demonstrates superior stability and functionality in various applications. The resulting Zr-HAMDB-MOF exhibits remarkable porosity and chemical stability, making it highly effective for applications such as sensor applications, catalysis, and gas storage and optimal candidate for both environmental and industrial applications.

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