THIAZOLE-BASED COVALENT ORGANIC FRAMEWORKS FOR LOW-HUMIDITY WATER ADSORPTION

Tech ID: 34312 / UC Case 2026-050-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

The critical challenge of providing clean, potable water in arid and semi-arid regions can be addressed by technologies that efficiently harvest atmospheric water, particularly under low-humidity conditions. UC Berkeley researchers have developed novel thiazole-based Covalent Organic Frameworks (COFs) that serve as highly efficient sorbents for this purpose. These COFs are crystalline, porous materials characterized by high porosity, permanent pore structures, and a chemically tunable nature. The disclosed COFs demonstrate a significant advantage over alternatives by exhibiting a low-humidity water uptake onset, coupled with fast adsorption kinetics, a high water working capacity, and excellent cycling stability. Furthermore, the development includes scalable synthetic methods, such as microwave-assisted and reflux routes, which enable gram-level, practical production.

SUGGESTED USES

- Potable water generation
- Atmospheric water harvesting
- Adsorption-driven heat exchangers
- Heat pumps
- Autonomous indoor humidity regulation
- Sustainable water supply systems
- Adsorption and separation

ADVANTAGES

- Low humidity water uptake onset (efficient in drier air)
- Fast adsorption kinetics

CONTACT

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OTHER INFORMATION

CATEGORIZED AS

» **Environment**
» Other
» **Materials & Chemicals**
» Chemicals
» Other
» **Nanotechnology**
» Materials
» Other
» **Engineering**
» Other

RELATED CASES

2026-050-0

- High water working capacity
- Excellent cycling stability (durable for repeated use)
- Scalable synthetic methods (microwave-assisted and reflux routes) enabling gram-level production
- High porosity and permanent pore structures
- Tunable chemistry

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Coordinative Alignment Of Molecules In Chiral Metal Organic Frameworks
- Exceptional Zeolitic Imidazolate Frameworks And A General Strategy To Make More
- Hydroxamate-Based Metal-Organic Frameworks
- Mof Heterolites: Mesoscopic Heterogeneity Within Order With Porous Nanocrystals
- PFAS Removal from Water Through Fluorinated Cationic Reticular Materials
- Sorption-Based Atmospheric Water Harvesting Device
- Molecular Weaving Additives To Enhance The Mechanical Properties Of Materials
- Hydrochromic Reticular Materials

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