

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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INVENTORS

- » Yaghi, Omar M.

OTHER INFORMATION

CATEGORIZED AS

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

RELATED CASES

2026-050-0

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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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