

# LICENSING OPPORTUNITY: A SAFER AND MORE EFFICIENT WAY TO STORE HYDROGEN FOR CLEAN ENERGY

## DESCRIPTION

### Problem

Traditional hydrogen storage methods often suffer from low efficiency, high costs, and safety concerns. Many existing systems require high-pressure tanks or cryogenic temperatures, which can be expensive and difficult to manage. This invention provides a more compact and efficient storage solution, reducing the need for extreme conditions. By using metal-organic frameworks (MOFs), hydrogen can be stored at lower pressures while maintaining high capacity, improving safety and accessibility. This advancement makes hydrogen more practical for commercial and industrial applications.

### Invention

This invention introduces a hydrogen fuel storage system that uses metal-organic frameworks (MOFs) to efficiently store molecular hydrogen. The MOFs are designed with a porous re-centered oxygen-type aluminum formate structure, allowing for high-density hydrogen storage. The system improves storage capacity, stability, and release efficiency, making hydrogen more practical for energy applications. The invention can be used in fuel cells, transportation, and industrial hydrogen applications. Overall, it enhances hydrogen storage technology, making it more viable for widespread use.

## BENEFITS

### Potential Commercial Applications

This technology can be applied in hydrogen-powered vehicles, improving fuel efficiency and storage capacity. It can also be used in stationary fuel cells for clean energy production. Industrial sectors that rely on hydrogen for manufacturing and chemical processes can benefit from safer and more efficient storage. The invention supports renewable energy integration, making hydrogen a more viable alternative to fossil fuels. Additionally, it can be used in portable hydrogen storage solutions, expanding its use in various industries.

### Competitive Advantage

Compared to traditional hydrogen storage methods, this invention offers higher storage density at lower pressures, improving safety and efficiency. The MOF-based system is lighter and more compact, making it ideal for transportation and mobile applications. It reduces energy consumption and costs associated with high-pressure or cryogenic storage. The technology enhances hydrogen accessibility, supporting the growth of hydrogen-based energy solutions. Overall, it provides a more practical and scalable hydrogen storage option.

Contact: [licensing@nist.gov](mailto:licensing@nist.gov)

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OFFICE

NIST Technology Partnerships Office  
National Institute of Standards and Technology  
100 Bureau Drive, Gaithersburg, MD 20899-2200