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Metal Organic Frameworks Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025 - 2034

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Abstracts

The Global Metal Organic Frameworks Market reached USD 9.8 billion in 2024 and is projected to grow at a CAGR of 14.2% from 2025 to 2034. MOFs are gaining prominence due to their versatile applications in clean energy solutions, such as carbon capture, hydrogen storage, and energy storage. Their ability to efficiently adsorb gases like CO2 and store hydrogen positions them as a crucial component in advancing sustainable energy initiatives. As industries prioritize reducing environmental impact, MOFs present an innovative alternative to traditional materials.

However, the market faces challenges, primarily due to high production costs. The synthesis of MOFs involves complex processes and expensive raw materials, making them less economically viable for price-sensitive industries like construction and manufacturing. Additionally, the scalability of MOF production is still evolving, as large-scale manufacturing techniques remain under development, limiting their accessibility and contributing to higher costs.

The market is segmented by product type into copper-based, iron-based, magnesium-based, zinc-based, and others. In 2024, the copper-based segment garnered USD 3 billion in revenue, driven by unique properties, such as high permanence and catalytic action. These MOFs are widely utilized in applications like gas storage, carbon capture, and drug delivery. Ongoing research to enhance the functioning and scalability of copper-based MOFs further cements their dominance in the market.

In terms of synthetic methods, the market is categorized into mechanochemical, hydro (solvo) thermal, electrochemical, microwave, ultrasonic, and others. The hydro (solvo) thermal segment held a 35.6% share in 2024, attributed to its precision in creating

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MOFs with tailored properties. This method, which uses controlled temperature and pressure in solvent-rich environments, ensures accurate control over MOF shape and pore size. Its diverse applications, including gas storage and chemical sensing, make it a leading synthesis technique, strengthening its market position.

U.S. metal organic frameworks market generated USD 2.6 billion in revenue in 2024, bolstered by expanding applications in gas storage, energy storage, and carbon capture. MOFs' high surface area and tunable properties provide distinct advantages, meeting the growing demand for advanced materials in sustainable energy. Significant investments in clean energy and cutting-edge research further drive innovation, positioning the U.S. as a critical player in the global MOF industry. With industries increasingly adopting green technologies, the demand for MOFs is expected to rise, ensuring continued market growth.

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Contents

Report Content

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CHAPTER 8 MARKET SIZE AND FORECAST, BY REGION, 2021-2034 (USD BILLION, KILO TONS)

CHAPTER 9 COMPANY PROFILES

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