

Metal Organic Frameworks Market by Type (Zinc-based, Copper-based, Iron-based, Aluminium-based, Chromium-based), Synthesis Method (Solvothermal/Hydrothermal, Microwave-assisted, Mechanochemical), and Region - Global forecast to 2030

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Abstracts

The metal organic frameworks market is estimated at USD 0.51 billion in 2024 and is projected to reach USD 1.70 billion by 2030, at a CAGR of 22.1% from 2024 to 2030. Zinc-based metal organic frameworks are non-toxic and biodegradable that are most prominently used as a drug carrier for biomedical applications. They exhibit larger surface area, high porosity, and better thermal and chemical stability. These metal organic frameworks are synthesized using different synthesis techniques including solvothermal/hydrothermal, sonochemical, microwave-assisted, and mechanochemical. ZIF-8, ZIF-67, MOF-5 are some of the zinc-based metal organic frameworks that are used in wide range of applications such as gas storage, gas adsorption/separation, sensing & detection.

“In terms of value, solvothermal/hydrothermal segment accounted for the largest share of the overall metal organic frameworks market.”

In 2023, the solvothermal/hydrothermal synthesis method accounted for the largest share of the metal organic frameworks market, in terms of value. Due to its cost effectiveness, superior catalytic activity, and electrochemical characteristics, it is one of the most widely used synthesis route for the preparation of metal organic frameworks. It involves long-term heating of the reaction mixture at high pressure and temperature which enables the synthesis of metal organic frameworks. Solvothermal/hydrothermal

synthesis method offers higher yields and results in the growth of high quality crystals.

“In terms of value, Catalysis segment accounted for the third largest share of the overall metal organic frameworks market.”

In 2023, Catalysis segment accounted for the third largest share of the metal organic frameworks market, in terms of value. The high degree of crystallinity and uniform porosity of metal organic frameworks ensures efficient use of active sites making them an ideal candidate for heterogeneous catalysis. Large number of active sites enhances the reaction rates and improved selectivity. Metal organic frameworks can be easily modified by changing linkers substituents to increase affinity for reactants, or by growing the number of active catalytic sites. Additionally, metal organic frameworks act as a promising candidate for electrocatalytic and photocatalytic applications due to its unique properties.

“During the forecast period, the metal organic frameworks market in Asia Pacific region is projected to be the second largest region.”

The growth of metal organic frameworks in Asia Pacific is fuelled by rapid industrialization, increasing investments in research & development, technological advancements, and sustainability goals. Rising focus towards energy storage and hydrogen economy is fuelling the demand for high quality metal organic frameworks. China dominates the metal organic frameworks market due to large manufacturing base, abundant raw materials, cheap labour, and low production costs. Japan, South Korea, and India are significantly working on research and development activities to improve the efficiency of metal organic frameworks for wide range of applications.

This study has been validated through primary interviews with industry experts globally. These primary sources have been divided into the following three categories:

By Company Type- Tier 1- 60%, Tier 2- 20%, and Tier 3- 20%

By Designation- C Level- 33%, Director Level- 33%, and Others- 34%

By Region- North America- 30%, Europe- 25%, Asia Pacific- 25%, Latin America- 10%, Middle East & Africa (MEA)-10%.

The report provides a comprehensive analysis of company profiles:

Prominent companies include Nanorh (US), Framergy, Inc. (US), novoMOF (Switzerland), BASF SE (Germany), Numat Technologies, Inc. (US), MOFapps (Norway), Nuada (UK), ProfMOF (Norway), ACSYNAM (Canada), Promethean Particles Ltd. (UK).

Research Coverage

This research report categorizes the metal organic frameworks market By Type (Zinc-based, Copper-based, Iron-based, Aluminium-based, Chromium-based, and Others), By Synthesis method (Solvothermal/hydrothermal, Sonochemical, Microwave-assisted, Mechanochemical, Electrochemical, and Others), Application (Gas and liquid adsorption/separation, Water harvesting, Gas storage, Sensing & detection, Catalysis, and Others), Region (North America, Europe, Asia Pacific, the Middle East & Africa, and Latin America). The scope of the report includes detailed information about the major factors influencing the growth of the metal organic frameworks market, such as drivers, restraints, challenges, and opportunities. A thorough examination of the key industry players has been conducted in order to provide insights into their business overview, solutions, and services, key strategies, contracts, partnerships, and agreements. New product and service launches, mergers and acquisitions, and recent developments in the metal organic frameworks market are all covered. This report includes a competitive analysis of upcoming startups in the metal organic frameworks market ecosystem.

Reasons to buy this report:

The report will help the market leaders/new entrants in this market with information on the closest approximations of the revenue numbers for the overall metal organic frameworks market and the subsegments. This report will help stakeholders understand the competitive landscape and gain more insights to position their businesses better and plan suitable go-to-market strategies. The report also helps stakeholders understand the pulse of the market and provides them with information on key market drivers, restraints, challenges, and opportunities.

The report provides insights on the following pointers:

Analysis of key drivers (Higher operational yield of metal organic frameworks for efficient gas storage, growing demand for metal organic frameworks to curb down carbon emissions),

restraints (Stability issues of metal organic frameworks, High cost of metal organic frameworks), opportunities (Growing investments in green hydrogen projects to boost the market, Innovative water harvesting technologies), and challenges (Overcoming scalability challenges in metal organic framework production, Toxicity concerns in metal organic frameworks) influencing the growth of the metal organic frameworks market.

Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product & service launches in the metal organic frameworks market.

Market Development: Comprehensive information about lucrative markets – the report analyses the metal organic frameworks market across varied regions.

Market Diversification: Exhaustive information about new products & services, untapped geographies, recent developments, and investments in the metal organic frameworks market

Competitive Assessment: In-depth assessment of market shares, growth strategies and service offerings of leading players like Nanorh (US), Framergy, Inc. (US), novoMOF (Switzerland), BASF SE (Germany), Numat Technologies, Inc. (US), MOFapps (Norway), Nuada (UK), ProfMOF (Norway), ACSYNAM (Canada), Promethean Particles Ltd. (UK), ACMOFS (China), GS Alliance Co., Ltd. (Japan), Physical Sciences Inc. (US), Majd Onsor Fartak (Iran), SyncMOF Inc. (Japan), Immaterial Ltd. (UK), Atomis Inc. (Japan), CD Bioparticles (US), Nanowiz Tech (India), Kerone Engineering Solutions Ltd. (India), Nanoshel LLC (US), Jiangsu Xianfeng Nanomaterial Technology Co., Ltd. (China), Decarbontek, Inc. (US), Svante Technologies Inc. (Canada), Nanochemazone (India) among others in the metal organic frameworks market.

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