

Global Zinc-Air Battery Catalysts Market 2026 by Manufacturers, Regions, Type and Application, Forecast to 2032

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Abstracts

According to our (Global Info Research) latest study, the global Zinc-Air Battery Catalysts market size was valued at US\$ 9.05 million in 2025 and is forecast to a readjusted size of US\$ 18.87 million by 2032 with a CAGR of 10.8% during review period.

Zinc-Air Battery Catalysts are functional catalytic materials used in the air electrode of zinc-air batteries to accelerate oxygen electrochemical reactions and improve discharge performance, energy efficiency, power capability, and operating durability. In primary zinc-air batteries, catalysts mainly promote the oxygen reduction reaction (ORR), while electrically rechargeable zinc-air systems require oxygen evolution reaction (OER) activity or bifunctional ORR/OER catalytic capability during repeated charge-discharge operation. Commercial and emerging material routes include manganese-based catalysts, silver-based catalysts, platinum-group-metal-based catalysts, metal-nitrogen-carbon catalysts, other non-precious transition-metal-based catalysts, and metal-free carbon catalysts. Products are supplied mainly as dry catalyst powders, supported catalysts, dispersions, inks, slurries, and other formulations for air-electrode fabrication. This study focuses on catalyst materials supplied for zinc-air battery applications, covering primary batteries for hearing aids, medical and specialty electronics as well as rechargeable systems for stationary energy storage, backup power, telecom and other emerging applications. The market scope is defined by the commercial value of the catalytic material itself rather than the value of the complete air cathode or battery system.

Key Findings

The global weighted average selling price of zinc-air battery catalysts was approximately US\$35–50/kg in 2025.

Primary zinc-air batteries remained the main demand source, while rechargeable zinc-air batteries represented the key growth direction.

Manganese-based catalysts remained the largest product type.

Hearing aids and medical devices remained the largest downstream application.

Stationary energy storage was the fastest-growing application.

Non-precious-metal ORR catalysts and bifunctional ORR/OER catalysts continued to gain importance.

The United States, Japan, and China remained the major technology and supply regions.

Market Trends

The technology direction is shifting from conventional low-cost manganese-based ORR catalysts toward higher-activity non-precious-metal formulations and rechargeable-battery-oriented ORR/OER systems. For primary zinc-air cells, catalyst development remains focused on cost, durability, oxygen transport and consistency in mass production. For rechargeable systems, the technical requirement is more demanding because the air electrode must sustain reversible oxygen chemistry over repeated cycling, making bifunctional activity and electrochemical durability increasingly important. The U.S. Department of Energy identifies cathode-material optimization, new material discovery, demonstration projects and manufacturing ecosystem development among the important innovation areas for zinc battery commercialization.

Another important trend is the transition from catalyst powder sales toward application-specific material engineering. Catalyst suppliers increasingly combine active-material synthesis with carbon-support selection, dispersion, ink formulation, coating and electrode optimization. This raises the value contribution of formulation know-how and scale-up capability relative to the underlying raw material alone. Commercial suppliers are already positioning catalyst libraries, customized supports and electrode processing

as integrated development capabilities.

Market Dynamics

Drivers

The mature installed base of zinc-air hearing-aid batteries provides a relatively stable demand foundation for conventional catalysts, while long-duration energy storage creates the most important new demand pathway. Primary zinc-air button cells remain widely used in hearing aids, and the U.S. Department of Energy continues to identify zinc-air among zinc battery chemistries being developed for stationary and long-duration storage. Increasing emphasis on non-flammable aqueous battery chemistries, resource availability and reduced reliance on scarce precious metals also supports catalyst innovation.

Restraints

The main restraint is the different commercialization profile of the two major downstream markets. Conventional primary zinc-air batteries are technologically mature but face structural competition from rechargeable lithium-ion hearing-aid solutions; VARTA currently supplies both zinc-air and rechargeable lithium-ion solutions for hearing-aid applications. Rechargeable zinc-air batteries, by contrast, offer a larger long-term catalyst opportunity but still face cycle-life, reversible air-electrode efficiency, material stability and system-scale manufacturing challenges. The U.S. Department of Energy assessed the broader zinc-battery field at an intermediate stage of technology and manufacturing readiness, highlighting the remaining commercialization gap.

Opportunities

The strongest opportunity is the substitution of precious-metal catalysts with scalable non-precious-metal alternatives. Commercial rare-metal-free ORR technology is already being designed for metal-air batteries, and one current commercial platform reports mass-production suitability without special chemical processing and targets substantially lower catalyst cost than platinum-based alternatives. A second opportunity lies in the commercialization of rechargeable zinc-air systems for stationary storage, where catalyst suppliers can capture value not only from active materials but also from catalyst-support design, ink formulation, coating and optimized air-electrode integration.

A zinc-air long-duration storage collaboration announced in 2024 specifically targeted a non-precious-metal catalyst-coated air electrode to reduce cathode material cost.

Challenges

Catalyst performance cannot be evaluated by initial ORR or OER activity alone. Commercial success increasingly depends on durability under alkaline conditions, resistance to catalyst degradation, repeatable dispersion and coating quality, electrode-level mass transport, scale-up yield and customer qualification. Rechargeable systems add the difficulty of balancing ORR and OER performance in either a bifunctional catalyst or a coordinated multi-catalyst architecture. At the industry level, limited standardized testing protocols and relatively immature manufacturing ecosystems for emerging zinc storage technologies can slow the translation of laboratory catalyst performance into bankable commercial battery systems.

Industry Chain Analysis

The upstream chain includes manganese compounds, silver and platinum-group-metal precursors, iron, cobalt and nickel compounds, carbon supports, heteroatom precursors, solvents, binders and other formulation materials. Midstream activities comprise catalyst synthesis, active-site engineering, loading onto carbon or oxide supports, particle and surface control, dispersion, ink or slurry formulation, quality testing and scale-up manufacturing. Downstream customers include air-electrode manufacturers and zinc-air battery producers serving hearing aids, medical and specialty electronics, stationary storage, backup power and telecom applications. The catalyst industry therefore sits between commodity or specialty chemical inputs and highly application-specific electrochemical electrode manufacturing.

Value Chain Analysis

Value creation is moving away from simple raw-material conversion toward engineered catalytic performance and electrode compatibility. Conventional manganese-based materials compete heavily on consistency, cost and volume manufacturing, while advanced non-precious-metal and bifunctional catalysts derive a larger share of value from active-site design, proprietary synthesis, support selection, dispersion technology and application validation. Suppliers able to move from laboratory synthesis to pilot and commercial-scale production have a stronger competitive position because battery

developers require reproducible electrochemical performance across progressively larger batches. Nexceris explicitly positions its electrochemical development capability around material synthesis, component development and scale-up, while AZUL Energy combines catalyst development with support selection, dispersion and sheet-fabrication know-how.

Segment Insights

By primary active material, manganese-based catalysts remain the largest segment because of their established position in conventional zinc-air air electrodes and favorable cost structure. Silver-based and platinum-group-metal-based catalysts occupy specialized higher-cost applications, while metal-nitrogen-carbon, other non-precious transition-metal-based and metal-free carbon catalysts are strategically important development directions. By catalytic function, ORR catalysts dominate current commercial consumption because primary zinc-air batteries represent the largest installed demand base. Bifunctional ORR/OER catalysts have a smaller current commercial base but higher strategic importance in electrically rechargeable zinc-air systems.

By battery type, primary zinc-air batteries continue to account for the majority of catalyst demand, while rechargeable zinc-air batteries are expected to contribute a rising share of incremental demand. By product form, dry catalyst powders remain the basic commercial format, but dispersions, inks and slurries are gaining importance as suppliers move closer to air-electrode processing. Application-specific formulation capability can also command a higher value contribution than undifferentiated catalyst powder.

Downstream Market Opportunities

Hearing aids and medical devices remain the core established downstream market and provide recurring replacement demand for primary zinc-air cells. However, the opportunity is primarily stable-volume rather than disruptive growth because rechargeable lithium-ion hearing-aid technologies are increasingly available alongside zinc-air products. Stationary energy storage offers a fundamentally different growth profile. Zinc-air technologies are being evaluated for microgrids, renewable-energy integration, behind-the-meter storage and long-duration discharge, creating potential demand for higher-value non-precious-metal and bifunctional catalysts if project deployment scales.

Regional Insights

North America is an important development and scale-up region, supported by electrochemical materials engineering, pilot manufacturing capabilities and zinc-air long-duration storage development. The region is particularly relevant for custom catalyst development and the transition from laboratory materials to larger production batches.

Japan has emerged as an important commercialization center for advanced rare-metal-free ORR catalysts, with commercial products explicitly targeting metal-air battery applications and moving from customized project supply toward standardized availability. China has a broader manufacturing base in manganese materials, battery materials and air-electrode catalyst production, giving it potential cost and scale advantages as rechargeable zinc-air commercialization expands. Europe remains an important demand and battery-technology region, particularly in hearing-aid zinc-air cells and advanced electrochemical materials, although the verified specialized zinc-air catalyst supplier base is currently less concentrated.

Competitive Landscape Analysis

The competitive landscape remains fragmented and technically differentiated rather than dominated by a large number of scaled dedicated zinc-air catalyst manufacturers. North America is characterized by strong material scale-up and contract-development capabilities, Japan by specialized high-performance non-precious-metal catalyst commercialization, and China by its broader manganese and battery-material manufacturing foundation. This creates competition between established low-cost catalyst chemistry and emerging proprietary electrocatalyst platforms rather than a conventional commodity-material market.

Entry barriers are increasingly defined by repeatable electrochemical performance, scale-up know-how, customer-specific formulation, air-electrode integration and manufacturing quality control. As rechargeable zinc-air applications develop, regional competition is expected to shift toward companies and supply chains capable of combining catalyst performance with scalable electrode manufacturing. Given the still-specialized supplier structure and limited disclosure of zinc-air-specific catalyst revenue, the market is better characterized by technology positioning and manufacturing capability than by precise public market-share rankings.

Report Scope

This report is a detailed and comprehensive analysis for global Zinc-Air Battery Catalysts market. Both quantitative and qualitative analyses are presented by manufacturers, by region & country, by Type and by Application. As the market is constantly changing, this report explores the competition, supply and demand trends, as well as key factors that contribute to its changing demands across many markets. Company profiles and product examples of selected competitors, along with market share estimates of some of the selected leaders for the year 2025, are provided.

Key Features:

Global Zinc-Air Battery Catalysts market size and forecasts, in consumption value (\$ Million), sales quantity (Tons), and average selling prices (US\$/kg), 2021-2032

Global Zinc-Air Battery Catalysts market size and forecasts by region and country, in consumption value (\$ Million), sales quantity (Tons), and average selling prices (US\$/kg), 2021-2032

Global Zinc-Air Battery Catalysts market size and forecasts, by Type and by Application, in consumption value (\$ Million), sales quantity (Tons), and average selling prices (US\$/kg), 2021-2032

Global Zinc-Air Battery Catalysts market shares of main players, shipments in revenue (\$ Million), sales quantity (Tons), and ASP (US\$/kg), 2021-2026

The Primary Objectives in This Report Are:

To determine the size of the total market opportunity of global and key countries

To assess the growth potential for Zinc-Air Battery Catalysts

To forecast future growth in each product and end-use market

To assess competitive factors affecting the marketplace

This report profiles key players in the global Zinc-Air Battery Catalysts market based on the following parameters - company overview, sales quantity, revenue, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Nexceris, LLC, Hunan Yuanda New Materials Co., Ltd., AZUL Energy Inc., Cerpotech AS, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Zinc-Air Battery Catalysts market is split by Type and by Application. For the period 2021-2032, the growth among segments provides accurate calculations and forecasts for consumption value by Type, and by Application in terms of volume and value. This analysis can help you expand your business by targeting qualified niche markets.

Market Segmentation

Market segment by Type

ORR Catalysts

OER Catalysts

Bifunctional ORR/OER Catalysts

Others

Market segment by Primary Active Material

Manganese Based Catalysts

Silver Based Catalysts

Platinum Group Metal Based Catalysts

Metal Nitrogen Carbon Catalysts

Other Non Precious Transition Metal Based Catalysts

Metal Free Carbon Catalysts

Others

Market segment by Product Form

Dry Catalyst Powders

Catalyst Dispersions and Inks

Catalyst Pastes and Slurries

Others

Market segment by Application

Hearing Aids and Medical Devices

Consumer and Specialty Electronics

Stationary Energy Storage

Backup Power and Telecom

Research and Demonstration

Others

Major players covered

Nexceris, LLC

Hunan Yuanda New Materials Co., Ltd.

AZUL Energy Inc.

Cerpotech AS

Market segment by region, regional analysis covers

North America (United States, Canada, and Mexico)

Europe (Germany, France, United Kingdom, Russia, Italy, and Rest of Europe)

Asia-Pacific (China, Japan, Korea, India, Southeast Asia, and Australia)

South America (Brazil, Argentina, Colombia, and Rest of South America)

Middle East & Africa (Saudi Arabia, UAE, Egypt, South Africa, and Rest of Middle East & Africa)

Chapter Outline

Chapter 1, to describe Zinc-Air Battery Catalysts product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Zinc-Air Battery Catalysts, with price, sales quantity, revenue, and global market share of Zinc-Air Battery Catalysts from 2021 to 2026.

Chapter 3, the Zinc-Air Battery Catalysts competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Zinc-Air Battery Catalysts breakdown data are shown at the regional level, to show the sales quantity, consumption value, and growth by regions, from 2021 to 2032.

Chapter 5 and 6, to segment the sales by Type and by Application, with sales market share and growth rate by Type, by Application, from 2021 to 2032.

Chapter 7, 8, 9, 10 and 11, to break the sales data at the country level, with sales

quantity, consumption value, and market share for key countries in the world, from 2021 to 2026. and Zinc-Air Battery Catalysts market forecast, by regions, by Type, and by Application, with sales and revenue, from 2027 to 2032.

Chapter 12, market dynamics, drivers, restraints, trends, and Porters Five Forces analysis.

Chapter 13, the key raw materials and key suppliers, and industry chain of Zinc-Air Battery Catalysts.

Chapter 14 and 15, to describe Zinc-Air Battery Catalysts sales channel, distributors, customers, research findings and conclusion.

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