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Advanced Oxidation Processes in Water Treatment Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Technology (Hydroxyl Radical-Based AOPs, Non-hydroxyl Radical-Based AOPs, Electrochemical AOPs, Photocatalysis), By Reactor Type (Batch Reactors, Continuous Flow Reactors, Fixed-Bed Reactors, Suspension Reactors), By Application (Drinking Water Treatment, Industrial Wastewater Treatment, Municipal Wastewater Treatment, Groundwater and Soil Remediation, Recycled Water Treatment, Others), By Region & Competition, 2020-2030F

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Abstracts

Market Overview

The Global Advanced Oxidation Processes (AOPs) in Water Treatment Market was valued at USD 724.11 million in 2024 and is projected to reach USD 934.12 million by 2030, growing at a CAGR of 4.18% during the forecast period. AOPs are chemical treatment technologies that utilize powerful oxidizing agents—primarily hydroxyl radicals—to break down complex organic and inorganic pollutants in water. These processes are particularly effective in treating contaminants that are resistant to conventional water treatment methods, such as pharmaceuticals, pesticides, endocrine-disrupting chemicals, and industrial solvents. As global water scarcity concerns intensify and environmental regulations become more stringent, AOPs are being adopted by both

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municipal utilities and industrial facilities to ensure compliance and enhance water reuse potential.

The growing occurrence of emerging contaminants, coupled with increased awareness about the limitations of conventional treatment systems, has boosted the deployment of AOP systems across sectors including municipal wastewater treatment, industrial effluent processing, and drinking water purification. Additionally, heightened demand for reliable and safe water supplies in regions with limited freshwater resources is reinforcing the market's growth. Industrial sectors like textiles, chemicals, and pharmaceuticals are incorporating AOPs to improve water quality, meet discharge standards, and enable internal recycling of treated effluents.

Key Market Drivers

Rising Contamination from Emerging Pollutants

The proliferation of emerging pollutants—such as pharmaceutical residues, personal care chemicals, and endocrine disruptors—has raised serious environmental and health concerns. These compounds are not effectively removed by conventional water treatment systems, prompting increased investment in more advanced technologies. AOPs are well-suited to tackle these pollutants by generating hydroxyl radicals that can break down complex molecular structures into harmless end-products. As regulatory frameworks evolve to address these contaminants, particularly in Europe and North America, AOPs are being positioned as a critical component of modern water treatment strategies.

Key Market Challenges

High Operational and Capital Costs

The implementation of AOP systems presents considerable cost-related challenges, especially for small- and mid-sized utilities. Equipment such as UV reactors, ozone generators, and dosing systems for oxidizing agents (e.g., hydrogen peroxide, persulfates) require substantial capital investment. Ongoing operational expenses—including energy consumption, chemical usage, and frequent maintenance—further increase the total cost of ownership. Retrofitting existing treatment facilities with AOP infrastructure also adds to the complexity and financial burden. These high costs limit the widespread adoption of AOPs in developing regions or cost-sensitive sectors, despite their environmental advantages.

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Key Market Trends

Rising Adoption of AOPs in Industrial Wastewater Reuse

A growing number of industrial operations are turning to AOPs for wastewater reuse applications, especially in regions experiencing water scarcity. Sectors such as textiles, pharmaceuticals, food and beverage, and chemicals are deploying AOPs to remove high-load organics, colorants, and micro-contaminants from effluents, enabling internal water recycling and reducing freshwater dependency. AOPs are often integrated into Zero Liquid Discharge (ZLD) systems to meet strict environmental discharge norms and maximize water recovery. Countries like India, China, and those in the Middle East are witnessing increased on-site installation of AOP systems in industrial zones to support sustainable manufacturing practices and meet regulatory demands.

Key Market Players

Veolia Water Technologies

Xylem Inc.

AQUAFINE Corporation

Trojan Technologies

Kurita Water Industries Ltd.

Calgon Carbon Corporation

Advanced Oxidation Technologies

Pall Corporation

Lenntech B.V.

Aquatech International

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Report Scope:

In this report, the Global Advanced Oxidation Processes in Water Treatment Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Advanced Oxidation Processes in Water Treatment Market, By Technology:

- Hydroxyl Radical-Based AOPs
- Non-hydroxyl Radical-Based AOPs
- Electrochemical AOPs
- Photocatalysis

Advanced Oxidation Processes in Water Treatment Market, By Reactor Type:

- Batch Reactors
- Continuous Flow Reactors
- Fixed-Bed Reactors
- Suspension Reactors

Advanced Oxidation Processes in Water Treatment Market, By Application:

- Drinking Water Treatment
- Industrial Wastewater Treatment
- Municipal Wastewater Treatment
- Groundwater and Soil Remediation
- Recycled Water Treatment

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Others

Advanced Oxidation Processes in Water Treatment Market, By Region:

North America

United States

Canada

Mexico

Europe

Germany

France

United Kingdom

Italy

Spain

South America

Brazil

Argentina

Colombia

Asia-Pacific

China

India

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Japan

South Korea

Australia

Middle East & Africa

Saudi Arabia

UAE

South Africa

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Advanced Oxidation Processes in Water Treatment Market.

Available Customizations:

Global Advanced Oxidation Processes in Water Treatment Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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