



TECH 2019-8: Hydrogen Peroxide

Hydrogen Peroxide is one in a series of reports published as part of Nexant’s 2019 Technoeconomics – Energy & Chemicals (TECH) program.

Overview

Hydrogen peroxide (H₂O₂) is a colorless, slightly viscous liquid that is denser than water. It is relatively easy to handle and considered as a green/environmentally friendly chemical since the two byproducts of its decomposition are water and oxygen.

This TECH report provides an overview of the commercial and developing technologies for producing hydrogen peroxide and addresses the following questions:

- What are the major production technologies for hydrogen peroxide and how do they differ? Is the technology available and who are the key technology owners and licensors?
- What are the key developments in hydrogen peroxide technologies?
- What are the key market drivers?
- What is the business and regulatory environment like for hydrogen peroxide today?
- What are the key factors that impact overall economics for producing hydrogen peroxide across different geographic regions?

Commercial Technologies

Over 99 percent of the global capacity (and all the leaders’ production capacity) is based on the anthraquinone auto-oxidation process, which uses hydrogen and air as raw materials as well as an anthraquinone working compound. Other alternative processes are also reviewed.

R&D efforts, such as those directed toward developing a direct synthesis route (i.e., without the use of an anthraquinone working compound), are also discussed in the report.

Process Economics

The report includes estimates of hydrogen peroxide production costs for the second quarter of 2019 via the ethyl anthraquinone (EAQ) and amyl anthraquinone (AAQ) hydrogen auto-oxidation route, as well as a speculative direct route, for large-scale plants located in the United States Gulf Coast, North West Europe, the Middle East and China. These regions/countries accounted for about two-thirds of the global capacity in 2019.

Commercial Overview

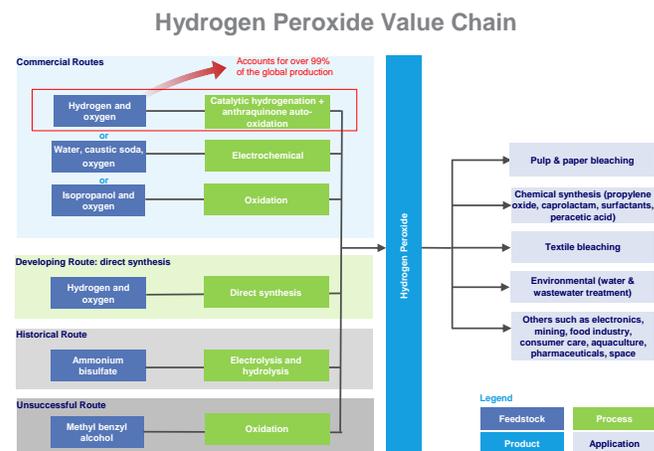
The hydrogen peroxide global demand in 2019 is estimated at 5.5 million tons and is forecast to grow by 4.7 percent per annum on average to about 7 million tons in 2024. Asia accounts for over half of the global demand due to the size of its pulp & paper industry.

An overview of the supply, demand, and trade of hydrogen peroxide on a global and regional basis (North America, Western Europe, Middle East, Asia Pacific and Rest of the World) is provided in this TECH report.

The applications for hydrogen peroxide fall into the following broad categories:

- Bleaching (paper, pulp and textile) as it is a strong, non-polluting oxidizing agent.
- Chemical Synthesis (principally HPPO – Hydrogen Peroxide to Propylene Oxide)
- Environmental (particularly wastewater treatment and chemical purification)
- Electronics
- Mining/Metallurgy

Others such as consumer care (hair and skin bleaching), aquaculture, pharmaceutical, healthcare, and aerospace applications.





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- Chemistry
- Process flow diagrams and descriptions of established/conventional, new and emerging processes
- Process economics – comparative costs of production estimates for different technologies across various geographic regions
- Overview of product applications and markets for new as well as established products
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Technology and Costs comprises the Technoeconomics – Energy & Chemicals (TECH) program (formerly known as PERP), the Biorenewable Insights program (BI), the Sector Technology Analysis, and the new Cost Curve Analysis. These programs provide comparative economics of different process routes and technologies in various geographic regions.

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