

# **Technology and Costs**

# **TECH 2021-1: Oxo Alcohols**



# Oxo Alcohols is one in a series of reports published as part of NexantECA's 2021 Technoeconomics – Energy & Chemicals (TECH) program.

### **Overview**

The main oxo alcohols are *n*-butanol, *i*-butanol, 2-ethylhexanol, isononanol and 2-propylheptanol. Oxoalcohols have traditionally been produced by the oxo (hydroformylation) process, a process that catalytically adds a carbon monoxide molecule to an olefinic hydrocarbon to generate an aldehyde.

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

- What are the major production technologies for oxo alcohols and how do they differ?
- Is the technology available and who are the key technology owners and licensors? What are the key differences between their offering?
- What are the key conventional and bio-based technology developments?
- What are the key market drivers?
- What is the business and regulatory environment like for oxo alcohols and their phthalate and nonphthalate plasticizer derivatives today?
- What are the key factors that impact overall economics for producing oxo-alcohols across different geographic regions?

## **Conventional Commercial Technologies**

The TECH report details the differences between the technologies of the main oxo-alcohols technology holders and licensors: JM and Dow, Mitsubishi, Eastman, OQ Chemicals, BASF and ExxonMobil.

## **Bio-based Developing Technologies**

This section reviews the commercial and developing bio-based routes such as the production of *i*-butanol via the ABE (Acetone, Butanol, and Ethanol) pathway, the production of *n*-butanol via a metabolic pathway, Guerbet reactions or from carbon dioxide.

## **Process Economics**

As nearly all the global capacity remains based on the conventional routes (as well as all announced capacity additions), the *n*-butanol, 2-EH, 2-PH and INA production costs via those routes for plants located in the United States, Western Europe, and China have been estimated for the second quarter of 2021. Indeed, those countries/regions account for about 70 percent of the global oxo alcohol capacity.

### **Commercial Overview**

This TECH report includes a global and regional (North America, Western Europe, and Asia Pacific) market review for *n*-butanol, *i*-butanol and 2-ethylhexanol.

Their global demand is estimated at 9.8 million tons in 2021 and is forecast to grow by 2.8 percent per annum on average to about 11 million tons in 2026.

Asia, North America, and Western Europe together represent about 90 percent of the total demand.

- Oxo alcohols and their derivatives are mostly used as solvents.
- End uses include mainly plasticizers, paints, coatings, inks, and adhesives.



#### **Oxo Alcohols Value Chain**

# For more information. please contact Technology@NexantECA.com or www.NexantECA.com

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Technology and Costs comprises the Technoeconomics – Energy & Chemicals (TECH) program, the Biorenewable Insights program (BI), 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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