

Oxo Chemicals

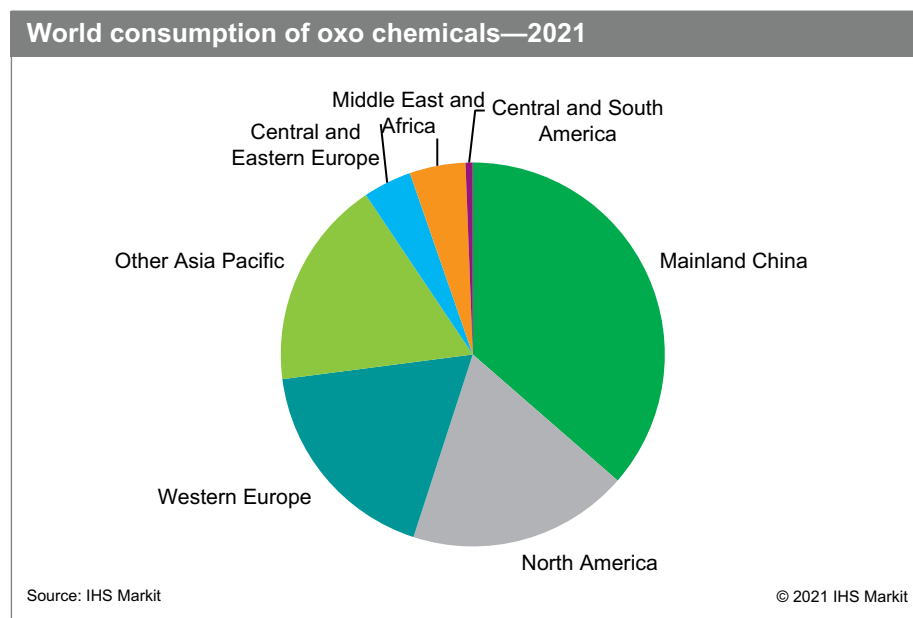
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Abstract

The oxo process or hydroformylation of olefins with synthesis gas is the principal route to C_3 - C_{15} aldehydes, which are converted to alcohols, acids, or other derivatives. By far the most important oxo chemical is n-butyraldehyde, followed by C_6 - C_{13} aldehydes for plasticizer alcohols, isobutyraldehyde, propionaldehyde, valeraldehyde, and C_{12} - C_{18} aldehydes for detergent alcohols.

Propylene-derived n-butyraldehyde and isobutyraldehyde accounted for approximately 77% of the world consumption of oxo chemicals in 2021. High consumption volumes for both of the alcohol derivatives of n-butyraldehyde—n-butanol and 2-ethylhexanol (2-EH)—will continue in the near future, largely owing to increased consumption of both alcohols in acrylate esters, acetate esters, and plasticizers. 2-EH and n-butanol continue to account for the majority of plasticizer alcohols consumption, combining for three-quarters of the global total.

The following pie chart shows world consumption of oxo chemicals:



Asia, Europe, and North America are the largest markets for oxo chemicals, together accounting for 95% of world demand in 2021. Oxo chemicals demand in mainland China is expected to grow relatively well, albeit at a slower growth rate than in previous years. Other Asian consumption, excluding mainland China and Japan, is

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also expected to grow well; India and Malaysia are the main growth markets in this region. Demand for oxo chemicals in the United States is expected to grow modestly during 2021–26. Western European consumption of oxo chemicals is forecast to also grow modestly, as will Japanese consumption.

By far, most oxo aldehydes are hydrogenated to alcohols. The large majority of the world consumption of n-butyraldehyde is converted to 2-EH and n-butanol, while all of the detergent and C₇-C₁₃ plasticizer oxo aldehydes are converted to their corresponding alcohols. Other oxo chemicals, including propionaldehyde, valeraldehyde, and isobutyraldehyde, have more varied applications. As a result, demand for oxo chemicals is strongly dependent on demand for C₄-C₁₃ plasticizer alcohols. Consumption of plasticizer alcohols, especially C₇-C₁₃ alcohols, depends greatly on demand for plasticizers and flexible PVC. Growth in the world consumption of plasticizer alcohols for plasticizers is forecast at 3.2% annually during the next few years. Solvent/coating applications are the largest end use for C₄-C₅ alcohols; this includes direct solvent use and derivative solvent use, mainly as acetates, glycol ethers, and acrylates.

World demand for 2-EH is still dependent on plasticizers production including nonphthalate dioctyl terephthalate (DOTP) plasticizer production and di(2-ethylhexyl) phthalate (DEHP) production. Global growth in DOTP as a substitute plasticizer for DEHP will continue to support 2-EH growth worldwide. In some regions, including the United States, Asia, and Western Europe, 2-EH consumption is also dependent on the production of 2-ethylhexyl acrylate.

Other plasticizer alcohols such as isononyl alcohol (INA) and 2-propylheptanol (2-PH) will also continue to grow as plasticizers derived from these alcohols (such as hydrogenated phthalates, DINP, and DPHP) will compete and substitute with traditional plasticizers. 2-PH is derived from valeraldehyde.

Oxo chemicals are not at risk of substitution by competing products; most consumption shifts in the major derivative, plasticizer alcohols, occur among different plasticizer alcohol types derived via the oxo process.

Plasticizers are the largest market for plasticizer alcohols in most regions; acrylate/methacrylate and acetate esters are also large-volume applications for plasticizer alcohols in many regions.

Overall, world consumption of oxo chemicals will grow at an average annual rate of just over 3%.

For more detailed information, see the table of contents, shown below.

IHS Markit's Chemical Economics Handbook – Oxo Chemicals is the comprehensive and trusted guide for anyone seeking information on this industry. This latest report details global and regional information, including



Global summary;
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Producers with
annual capacities
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Consumption and
forecasts by end use
application



Manufacturing
processes and
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Trade – imports
and exports

Key benefits

IHS Markit's Chemical Economics Handbook – *Oxo Chemicals* has been compiled using primary interviews with key suppliers and organizations, and leading representatives from the industry in combination with IHS Markit's unparalleled access to upstream and downstream market intelligence and expert insights into industry dynamics, trade, and economics.

This report can help you

- Identify trends and driving forces influencing chemical markets
- Forecast and plan for future demand
- Understand the impact of competing materials
- Identify and evaluate potential customers and competitors
- Evaluate producers
- Track changing prices and trade movements
- Analyze the impact of feedstocks, regulations, and other factors on chemical profitability

Contents

Executive summary	8
Summary	9
Introduction	16
Manufacturing processes	18
Propionaldehyde	18
Butyraldehydes	18
– Cobalt hydrocarbonyl catalyst	19
– Phosphine-modified cobalt catalyst	19
– Rhodium catalyst	19
Valeraldehydes	19
Higher aldehydes and alcohols	20
Carboxylic acids	20
– Oxo acids (derived from C6 and higher aldehydes)	20
– Neo acids	20
Supply and demand by region	22
United States	22
– Producing companies	22
– BASF	23
– Dow	23
– Eastman	23
– ExxonMobil	24
– OQ Chemicals	24
– Shell	24
– Production	26
– Consumption	26
– Propionaldehyde	27
– n-Propanol	28
– Propionic acid	31
– Trimethylolethane	32
– Dimethylolpropionic acid	33
– Other	33
– n-Butyraldehyde	34
– n-Butanol	34
– 2-Ethylhexanol	35
– Trimethylolpropane	36
– 2-Ethylhexanoic acid	37
– Polyvinyl butyral	38
– Methyl n-amyl ketone	39
– n-Butyric acid	39
– Other	40

– Isobutyraldehyde	40
– Condensation/esterification products	41
– Isobutanol	42
– Neopentyl glycol	43
– Isobutyric acid	45
– Isobutyl acetate	46
– Isobutylidene diurea	46
– Methyl isoamyl ketone	46
– Other	47
– Valeraldehyde	47
– 2-Propylheptanol	48
– Amyl alcohol	49
– Valeric acid	50
– Heptanoic and pelargonic acids (C7-C9 oxo acids)	51
– Branched oxo acids	53
– Neo acids	53
– Neodecanoic acid	54
– Neopentanoic acid	55
– Neononanoic acid	56
– C7-C13 plasticizer oxo alcohols	56
– Detergent oxo alcohols	57
– Price	57
– Trade	58
Canada	60
– Consumption	60
– Trade	60
Mexico	62
– Consumption	62
– Trade	62
Central and South America	63
– Producing companies	63
– Salient statistics	64
– Consumption	64
Western Europe	65
– Producing companies	65
– Production	68
– Consumption	69
– Propionaldehyde	70
– Propionic acid	71
– n-Propanol	71
– Other	71
– n-Butyraldehyde	71
– n-Butanol and 2-ethylhexanol (2-EH)	72

– 2-Ethylhexanoic and n-butyric acids	73
– Trimethylolpropane	74
– Polyvinyl butyral	75
– Other	75
– Isobutyraldehyde	76
– Isobutanol	76
– Neopentyl glycol	77
– Isobutylidene diurea	77
– Isobutyric acid and DL-pantolactone	77
– Valeraldehyde	77
– 2-Propylheptanol	78
– Amyl alcohol	79
– Valeric acid	79
– Heptanoic and pelargonic acids (C7-C9 oxo acids)	79
– Branched oxo acids	80
– Neo acids	81
– Neodecanoic acid	81
– Neopentanoic acid	82
– C7-C13 plasticizer oxo alcohols	82
– Detergent oxo alcohols	83
– Price	84
– Trade	84
– Imports	84
– Exports	85
Central Europe	86
– Producing companies	86
– Salient statistics	86
– Consumption	87
Commonwealth of Independent States (CIS)	87
– Producing companies	87
– Salient statistics	88
– Consumption	88
Middle East	89
– Producing companies	89
– Salient statistics	90
– Consumption	90
Africa	91
– Producing companies	91
– Salient statistics	92
– Consumption	92
Indian Subcontinent	93
– Producing companies	93
– Salient statistics	94

– Consumption	95
– n-Butyraldehyde	96
– Isobutyraldehyde	97
– Other	97
Mainland China	97
– Producing companies	97
– Salient statistics	102
– Consumption	103
– Propionaldehyde	104
– n-Propanol	104
– n-Propionic acid	105
– TME	105
– n-Butyraldehyde	105
– 2-Ethylhexanol	106
– n-Butanol	106
– Trimethylolpropane	106
– Polyvinyl butyral resin (PVB)	107
– Isobutyraldehyde	107
– Isobutanol	107
– Neopentyl glycol	108
– Other	108
– Valeraldehyde	108
– C7-C13 plasticizer oxo alcohols	109
– Other	109
– Trade	109
Japan	110
– Producing companies	110
– Production	111
– Consumption	112
– Propionaldehyde	113
– n-Butyraldehyde	114
– 2-Ethylhexanol	115
– n-Butanol	115
– Polyvinyl butyral	116
– Trimethylolpropane	116
– Other	117
– Isobutyraldehyde	118
– Neopentyl glycol	119
– Isobutanol	119
– Isobutylidene diurea	119
– DL-pantolactone	119
– Other	120
– Valeraldehyde	120

– Heptanoic and pelargonic acids (C7-C9 oxo acids)	120
– Branched oxo acids	120
– Neo acids	120
– C6-C13 plasticizer oxo alcohols	120
– Detergent oxo alcohols	121
– Price	121
– Trade	122
Other Northeast Asia	123
– Producing companies	123
– Salient statistics	124
– Consumption	125
– n-Butyraldehyde	127
– Isobutyraldehyde	128
– C7-C13 plasticizer oxo alcohols	128
Southeast Asia	128
– Producing companies	128
– Salient statistics	130
– Consumption	130
– n-Butyraldehyde	132
– Isobutyraldehyde	133
– C7-C13 plasticizer oxo alcohols	133
Oceania	133
Additional resources	135
Revisions	137
Data Workbook	138
Notice	139

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