

Organometallics

31 August 2020

Abstract

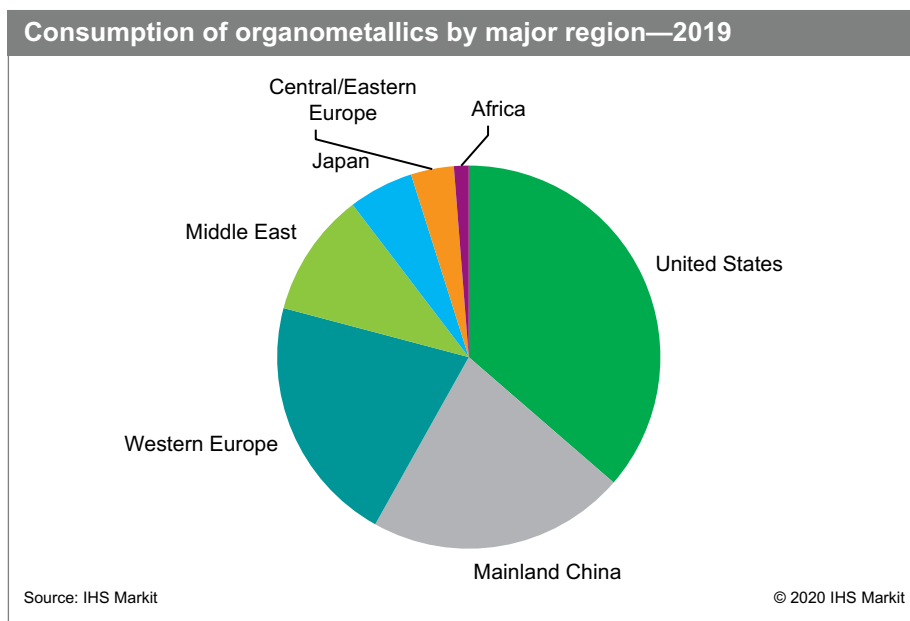
The main product categories covered in this report are organotin, organoaluminums, organomagnesiums, and organolithiums.

Nonbiocidal organotin are used largely as additives for polyvinyl chloride (PVC), but also in catalysis of several products, including rigid polyurethanes and silicones. Biocidal organotin are used in agriculture as fungicides and miticides, and as preservatives/antifoulants on wood surfaces, in closed-circuit cooling towers, and in marine paints.

Organoaluminums are used primarily as catalysts for the synthesis of polymers, including polypropylene, polyethylene, and several elastomers. Use as a catalyst for other syntheses includes olefin oligomerization and the Dimersol process for gasoline production.

Organomagnesiums are used as catalysts for polyolefin production and in the synthesis of pharmaceutical and fine chemicals. Organolithiums are used as catalysts for polybutadiene elastomer production and in the synthesis of pharmaceuticals.

The following pie chart shows merchant consumption of organometallics by major region, based on value:



The overall business environment for organometallics includes the following characteristics:

Contacts

Maria deGuzman • Maria.deguzman@ihsmarkit.com

- Greater regulations and restrictions (e.g., tributyltins in markets such as biocides/paint and PVC stabilizers). Because of stricter environmental demands, organotin antifoulants have been phased out and replaced by copper-based or other alternatives.
- Volatile raw materials (metals) costs, along with processing cost fluctuations, adversely affect the development of markets for some organometallics in certain applications (e.g., organotin stabilizers).
- The rapid expansion and maturation of the LED and solar cell markets has hastened demand for high-purity organometallics for use in metal organic chemical vapor deposition and other thin-film applications.
- Polyvinyl chloride additive applications remain the main markets for organotins, especially in mainland China and the United States.
- Catalyst applications remain the main markets for organoaluminums, organomagnesiums, and organolithiums.

Organotins are the largest-volume products followed by the organoaluminums. Combined, the two account for more than 97% of the total volume and more than 90% of the total value of the global organometallics market. Mainland China is the largest consumer of organotins for PVC applications, while both China and the United States are nearly equal biocidal consumers. In organoaluminums, the United States remains the largest consumer, followed by mainland China, Western Europe, and the Middle East.

The US market for organotins, which is tied to the construction, housing, and home remodeling markets, has slowed recently, following years of recovery since the economic crisis in 2009. In 2020, the recession, compounded by temporary construction holds imposed due to COVID-19, led to declines for PVC and organotins.

The largest share of the organometallic market in Western Europe is accounted for by organotins (47%) and organoaluminums (44%). The commercial consumption of these organometallics in other regions (Central and Eastern Europe, the Middle East, and Africa) is relatively small. Western Europe had been the only producing area in the region, until 2013, when organoaluminum production began in the Middle East, to supply the region's growing polyolefin production.

The development of mainland China's organometallics market has been intrinsically tied to the country's strong economic growth and the rapid expansion of the plastics industry. An insatiable buildup of capacity for PVC, polyethylene, and other resins hastened an equal need for sufficient supplies of organometallics. In 2019, mainland China accounted for nearly half of estimated global consumption of organotins and more than 20% of global consumption of organoaluminums, driven by growing production of PVC and polyolefins.

Japanese consumption of diorganotins for the PVC stabilizer market has remained at about the same level for the last five years; consumption of triorganotins ceased in 1999 as a result of environmental legislation. Organoaluminum consumption has been decreasing because of improved performance of organoaluminum catalysts and a general decline in polyolefin production. Overall, Japanese consumption of organometallics will be flat to declining over the next five years.

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

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



Global summary;
regional coverage



Producers with
annual capacities
and plant sites



Production figures
and trends



Consumption and
forecasts by end use
application



Manufacturing
processes and
environmental issues



Trade – imports
and exports

Key benefits

IHS Markit's Chemical Economics Handbook – *Organometallics* 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
United States	12
Europe, the Middle East, and Africa	13
Mainland China	14
Japan	15
Introduction	16
Organotins	18
Description and properties	18
– Nonbiocidal organotins—RSNX3 and R2SNX2	18
– Description	18
– Mechanism of PVC stabilization with mono- and dialkyltins	18
– Biocidal organotins—R3SNX	19
Manufacturing processes	20
– Nonbiocidal organotins	20
– Biocidal organotins	21
Environmental issues	21
Supply and demand by region	23
– United States	23
– Producing companies	23
– Consumption	25
– Nonbiocidal organotins	25
– Biocidal organotins	30
– Price	33
– Trade	35
– Canada	36
– Western Europe	37
– Introduction	37
– Corporate activities	37
– Associations and interest groups	39
– Rules and regulations	39
– Producing companies	42
– Salient statistics	43
– Consumption	44
– PVC	46
– Catalysts	47
– Glass coatings	48
– Biocides	48
– Price	48
– Trade	49

– Central and Eastern Europe	49
– Salient statistics	49
– Consumption	50
– Middle East	51
– Producing companies	51
– Salient statistics	51
– Consumption	52
– Africa	53
– Salient statistics	53
– Consumption	54
– Indian Subcontinent	54
– Producing companies	54
– Consumption	56
– Mainland China	56
– Producing companies	56
– Salient statistics	57
– Consumption	58
– PVC stabilizers	59
– Catalyst use	59
– Biocidal use	59
– Price	59
– Trade	59
– Japan	60
– Producing companies	60
– Production	61
– Consumption	62
– Price	64
– Trade	64
– Northeast Asia	65
– Producing companies	65
– Consumption	65
– Southeast Asia and Oceania	65
– Producing companies	65
– Consumption	66
Organoaluminums	67
Description and properties	67
Manufacturing processes	68
– Aluminum alkyls and hydrides	68
– Aluminum halides and sesquihalides	69
Environmental issues	69
Supply and demand by region	70
– United States	70
– Producing companies	70

– Consumption	71
– Catalysts for polymer synthesis	72
– Catalysts for other syntheses	83
– Price	84
– Trade	85
– Canada	85
– Western Europe	86
– Producing companies	86
– Salient statistics	88
– Consumption	89
– Price	90
– Trade	91
– Central and Eastern Europe	91
– Middle East	92
– Africa	92
– Indian Subcontinent	93
– Producing companies	93
– Consumption	94
– Mainland China	94
– Producing companies	94
– Consumption	94
– Price	95
– Japan	95
– Producing companies	95
– Salient statistics	96
– Consumption	97
– Price	100
– Trade	100
– Imports	100
– Exports	100
– Northeast Asia	100
– Producing companies	100
– Consumption	101
– Southeast Asia and Oceania	101
– Consumption	101
Organomagnesiums and organolithiums	103
Description and properties	103
– Organomagnesium compounds	103
– Organolithium compounds	103
Manufacturing processes	104
– Organomagnesium compounds	104
– Organolithium compounds	104
Environmental issues	105

Supply and demand by region	105
– United States	105
– Producing companies	105
– Consumption	107
– Organomagnesium compounds	108
– Organolithium compounds	109
– Price	110
– Trade	111
– Western Europe	111
– Producing companies	111
– Organomagnesium compounds	111
– Organolithium compounds	112
– Salient statistics	112
– Organomagnesium compounds	112
– Organolithium compounds	113
– Price	115
– Trade	115
– Central and Eastern Europe	116
– Middle East	116
– Africa	116
– Indian Subcontinent	116
– Mainland China	117
– Producing companies	117
– Consumption	118
– Organomagnesiums	118
– Organolithiums	118
– Price	118
– Japan	119
– Producing companies	119
– Organomagnesium compounds	119
– Organolithium compounds	119
– Consumption	120
– Organomagnesium compounds	120
– Organolithium compounds	120
– Price	120
– Trade	120
– Northeast Asia	120
Organozincs	121
Description and properties	121
Supply and demand by region	121
– United States	121
– Producing companies	121
– Consumption	122

– Trade	122
– Western Europe	123
– Producing companies	123
– Salient statistics	123
– Consumption	124
– Price	125
– Trade	125
– Central and Eastern Europe	125
– Middle East	125
– Africa	125
– Indian Subcontinent	126
– Mainland China	126
– Producing companies	126
– Consumption	126
– Price	126
– Japan	126
– Northeast Asia	127
Additional resources	128
Revisions	130

IHS Markit Customer Care

CustomerCare@ihsmarkit.com

Americas: +1 800 IHS CARE (+1 800 447 2273)

Europe, Middle East, and Africa: +44 (0) 1344 328 300

Asia and the Pacific Rim: +604 291 3600

Disclaimer

The information contained in this report is confidential. Any unauthorized use, disclosure, reproduction, or dissemination, in full or in part, in any media or by any means, without the prior written permission of IHS Markit or any of its affiliates ("IHS Markit") is strictly prohibited. IHS Markit owns all IHS Markit logos and trade names contained in this report that are subject to license. Opinions, statements, estimates, and projections in this report (including other media) are solely those of the individual author(s) at the time of writing and do not necessarily reflect the opinions of IHS Markit. Neither IHS Markit nor the author(s) has any obligation to update this report in the event that any content, opinion, statement, estimate, or projection (collectively, "information") changes or subsequently becomes inaccurate. IHS Markit makes no warranty, expressed or implied, as to the accuracy, completeness, or timeliness of any information in this report, and shall not in any way be liable to any recipient for any inaccuracies or omissions. Without limiting the foregoing, IHS Markit shall have no liability whatsoever to any recipient, whether in contract, in tort (including negligence), under warranty, under statute or otherwise, in respect of any loss or damage suffered by any recipient as a result of or in connection with any information provided, or any course of action determined, by it or any third party, whether or not based on any information provided. The inclusion of a link to an external website by IHS Markit should not be understood to be an endorsement of that website or the site's owners (or their products/services). IHS Markit is not responsible for either the content or output of external websites. Copyright © 2020, IHS Markit®. All rights reserved and all intellectual property rights are retained by IHS Markit.

