

World Chiral Chemicals Market by Players, Regions,  
Type and Application, Forecast to 2025

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# World Chiral Chemicals Market by Players, Regions, Type and Application, Forecast to 2025

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## Product Summary

### Definition

Chiral chemicals are a special class of compounds, which contains an asymmetrical carbon center in the molecule. The chiral molecules are non-superimposable on their mirror image, which are known as enantiomers or optical isomers.

Market Segment by company, details are as below, Sales, Revenue, Price, Cost and Gross Margin of each players will be included in this report

BASF

Dow

Solvias

Johnson

W. R. Grace

Thermo Fisher Scientific

Agilent

Albemarle

Alps Pharmaceutical

Bachem

Beckman

Boulder Scientific

Cambrex Corporation

Chiral Technologies

Codexis

Corden Pharma

Daicel Corporation

Digital Specialty Chemicals

Groupe Novasep

JASCO

PerkinElmer

Regis Technologies

Rhodia

Shanghai Hanhong Chemical



SK Corporation  
 Strem Chemicals  
 Suzhou ChonTech PharmaChem Technology  
 Waters Corporation

Split by regions, this report splits global market into several key regions, with Sales, Revenue, Price and Gross Margin, market share of top players in these regions, from 2014 to 2025 (forecast), like

### Table Market Performance by Regions

Regions	Countries
North America	United States
	Canada
	Mexico
	North America Total
Europe	Germany
	France
	UK
	Russia
	Italy
	Europe other
	Europe Total
Asia-Pacific	China
	Japan
	Korea
	India
	Southeast Asia
	Asia-Pacific Other
	Asia-Pacific Total
South America	Brazil
	Argentina
	Colombia
	South America Other
	South America Total
Middle East and Africa	Saudi Arabia
	UAE
	Egypt
	Nigeria
	South Africa
	Middle East and Africa Other
	Middle East and Africa Total

Source: Experts Interview, Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Split by Types, with Sales, Revenue, Growth Rate of each type, can be divided into



- 
1. Tachnology
  2. Traditional Separation Method
  3. Asymmetric Preparation Method
  4. Biological Separation Method
  5. Others

**Split by applications, this report focuses on Sales, Market share and Growth Rate of Chiral Chemicals in each application, can be divided into**

1. Pharmaceutical
2. Agrochemical
3. Flavors and Fragrances
4. Others

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## Report Measurement

	Measurement
Production Volume; Sales	Unit
Price	USD/Unit
Revenue	Million USD
Gross Profit; Share	%

## Report Content

Segments	Details
Chapter 1	Product definition; Report Scope; Industrial Chain;
Chapter 2	Industrial Chain;
Chapter 3	Industrial Situation
Chapter 4	Sales, Revenue and Growth Rate by Type
Chapter 5	Asia Pacific Market Assessment by Type
Chapter 6	North America Market Assessment by Type
Chapter 7	Europe Market Assessment by Type
Chapter 8	South America Market Assessment by Type
Chapter 9	Middle East and Africa Market Assessment by Type
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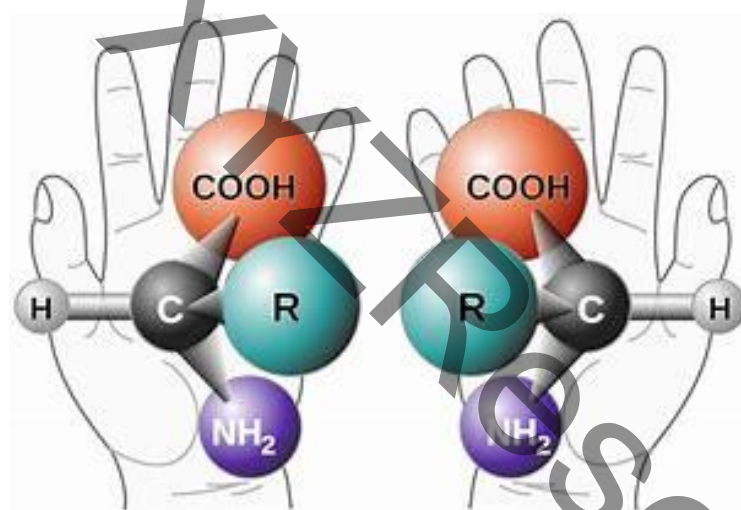


# 1 Report Overview

## 1.1 Definition

Chiral chemicals are a special class of compounds, which contains an asymmetrical carbon center in the molecule. The chiral molecules are non-superimposable on their mirror image, which are known as enantiomers or optical isomers.

Figure Product Picture of Chiral Chemicals



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



### 1.1.1 Players Covered in This Market

Table Players List in the Report 2019

Breakdown by Company	Revenue (Million USD)	
	Value	Market Share
BASF	Xx	Xx
Dow	Xx	Xx
Solvias	Xx	Xx
Johnson	Xx	Xx
W. R. Grace	Xx	Xx
Thermo Fisher Scientific	Xx	Xx
Agilent	Xx	Xx
Albemarle	Xx	Xx
Alps Pharmaceutical	Xx	Xx
Bachem	Xx	Xx
Beckman	Xx	Xx
Boulder Scientific	Xx	Xx
Cambrex Corporation	Xx	Xx
Chiral Technologies	Xx	Xx
Codexis	Xx	Xx
Corden Pharma	Xx	Xx
Daicel Corporation	Xx	Xx
Digital Specialty Chemicals	Xx	Xx
Groupe Novasep	Xx	Xx
JASCO	Xx	Xx
PerkinElmer	Xx	Xx
Regis Technologies	Xx	Xx
Rhodia	Xx	Xx
Shanghai Hanhong Chemical	Xx	Xx
SK Corporation	Xx	Xx
Strem Chemicals	Xx	Xx
Suzhou ChonTech PharmaChem Technology	Xx	Xx
Waters Corporation	Xx	Xx
Global Other	Xx	Xx
Global Total	Xx	Xx

Source: Secondary Sources and XYZ-Research Chemical &amp; Material Research Center, 2019



## 1.1.2 Mergers & Acquisitions, Expansion Plans

Table Mergers & Acquisitions, Expansion Plans

Date	Business Activity	Details
September 25, 2017	BASF further expands production capacity at specialty amines complex in Nanjing, China	Multi-product specialty amines plant Supports rising demand for specialty amines in Asia Startup planned in 2019 Ludwigshafen, Germany and Shanghai, China – September 25, 2017 – BASF will build a new specialty amines plant at its existing wholly owned site in Nanjing Chemical Industry Park in China. The new multi-product plant can manufacture 21,000 metric tons per year and further extends BASF’s amines portfolio at the specialty amines complex in Nanjing. The plant is scheduled to come on stream in 2019 and will mainly produce 1,2-Propylenediamine (1,2-PDA), n-Octylamine (n-OA) and Polyetheramine (PEA).

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 1.1.3 Type Overview

Table Global Chiral Chemicals Market Size (Volume) and Growth Rate by Type (2019-2025)

	2019	2025	CAGR
<b>Technology</b>	3434	6509	11.25%
Traditional Separation Method	25093	48351	11.55%
Asymmetric Preparation Method	16921	32692	11.60%
Biological Separation Method	7525	14256	11.24%
Other	933	2174	15.15%
<b>Total</b>	53906	103981	11.57%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 1.1.4 Application Overview

Table Global Chiral Chemicals Market Share by Application (2019-2025) (Million USD)

By Application	Market Share 2019	2019	2025	CAGR (2019-2025)
		Consumption	Consumption	
Pharmaceutical	68.53%	36942	71009	11.51%
Agrochemical	22.25%	11994	23302	11.70%
Flavors and Fragrances	6.27%	3380	6416	11.27%
Others	2.95%	1590	3254	12.68%
<b>Total</b>	100%	53906	103981	11.57%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

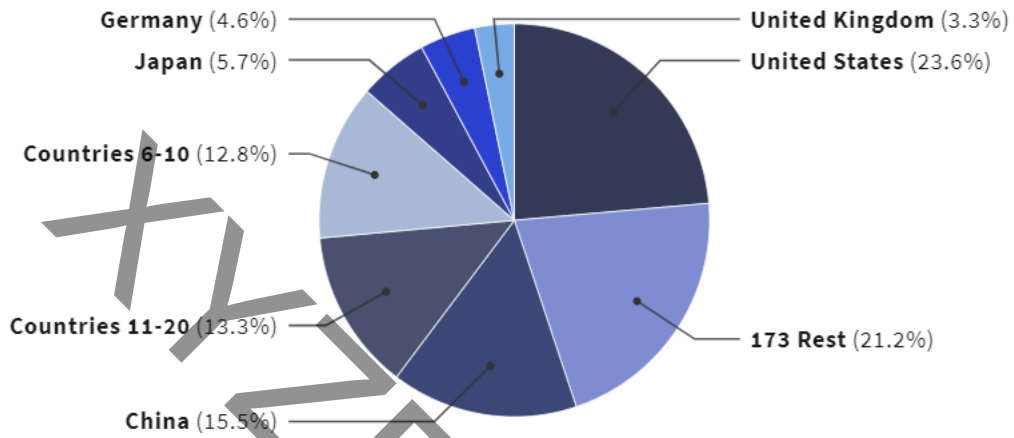




## 2 Industry Situation

### 2.1.1 Economic/Political Environment

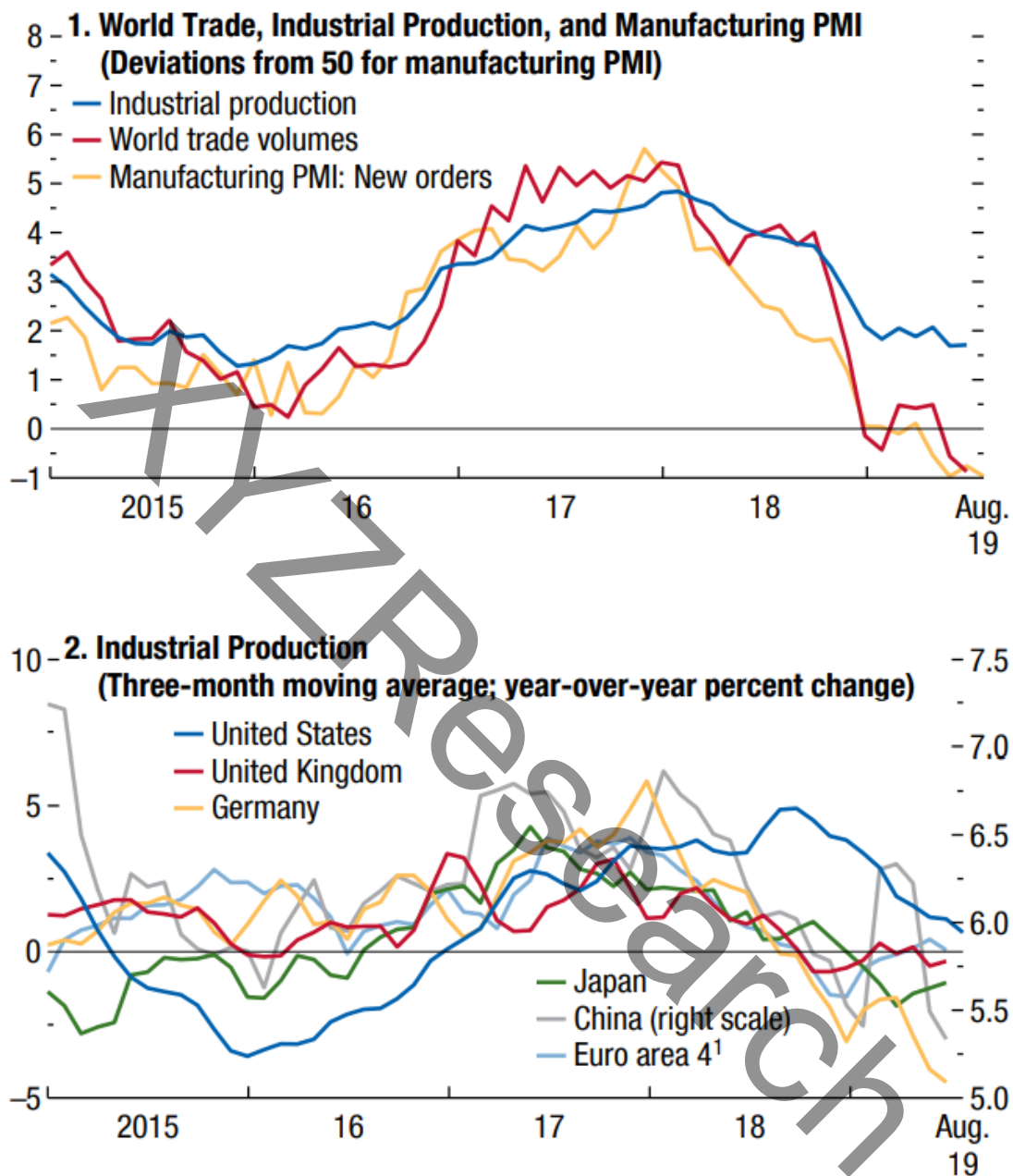
Figure % Share of the Global Economy



The 173 countries outside the top 20 make up less than a fourth of the total global economy.



Figure Global Activity Indicators (Three-month moving average; year-over-year percent change, unless noted otherwise)



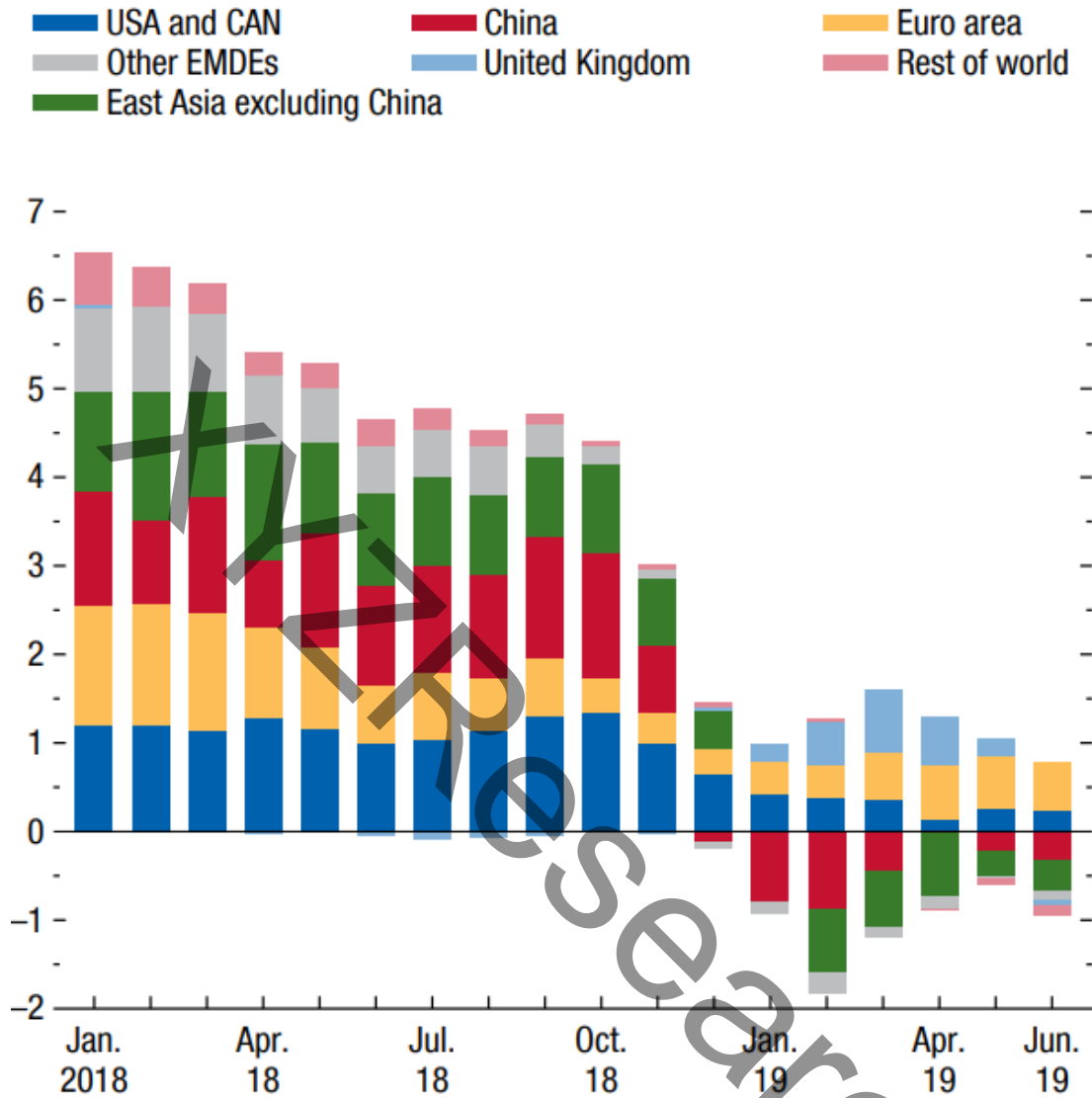
Sources: CPB Netherlands Bureau for Economic Policy Analysis; Haver Analytics; Markit Economics; and IMF staff calculations.

Note: PMI = purchasing managers' index. 1 Euro area 4 comprises France, Italy, the Netherlands, and Spain.

Over the past 12 months there has been a geographically broad-based, notable slowdown in industrial output.



Figure Contribution to Global Imports (Percentage points, three-month moving average)



Source: IMF staff calculations.

Note: CAN = Canada; EMDEs = emerging market and developing economies; USA = United States.



## Table Overview of the World Economic Outlook Projections

(Percent change, unless noted otherwise)

	2018	Projections		Difference from July 2019 WEO Update <sup>1</sup>		Difference from April 2019 WEO <sup>1</sup>	
		2019	2020	2019	2020	2019	2020
<b>World Output</b>	<b>3.6</b>	<b>3.0</b>	<b>3.4</b>	<b>-0.2</b>	<b>-0.1</b>	<b>-0.3</b>	<b>-0.2</b>
<b>Advanced Economies</b>	<b>2.3</b>	<b>1.7</b>	<b>1.7</b>	<b>-0.2</b>	<b>0.0</b>	<b>-0.1</b>	<b>0.0</b>
United States	2.9	2.4	2.1	-0.2	0.2	0.1	0.2
Euro Area	1.9	1.2	1.4	-0.1	-0.2	-0.1	-0.1
Germany <sup>2</sup>	1.5	0.5	1.2	-0.2	-0.5	-0.3	-0.2
France	1.7	1.2	1.3	-0.1	-0.1	-0.1	-0.1
Italy	0.9	0.0	0.5	-0.1	-0.3	-0.1	-0.4
Spain	2.6	2.2	1.8	-0.1	-0.1	0.1	-0.1
Japan	0.8	0.9	0.5	0.0	0.1	-0.1	0.0
United Kingdom	1.4	1.2	1.4	-0.1	0.0	0.0	0.0
Canada	1.9	1.5	1.8	0.0	-0.1	0.0	-0.1
Other Advanced Economies <sup>3</sup>	2.6	1.6	2.0	-0.5	-0.4	-0.6	-0.5
<b>Emerging Market and Developing Economies</b>	<b>4.5</b>	<b>3.9</b>	<b>4.6</b>	<b>-0.2</b>	<b>-0.1</b>	<b>-0.5</b>	<b>-0.2</b>
Emerging and Developing Asia	6.4	5.9	6.0	-0.3	-0.2	-0.4	-0.3
China	6.6	6.1	5.8	-0.1	-0.2	-0.2	-0.3
India <sup>4</sup>	6.8	6.1	7.0	-0.9	-0.2	-1.2	-0.5
ASEAN-5 <sup>5</sup>	5.2	4.8	4.9	-0.2	-0.2	-0.3	-0.3
Emerging and Developing Europe	3.1	1.8	2.5	0.6	0.4	0.6	0.2
Russia	2.3	1.1	1.9	-0.1	0.0	-0.5	0.2
Latin America and the Caribbean	1.0	0.2	1.8	-0.4	-0.5	-1.2	-0.6
Brazil	1.1	0.9	2.0	0.1	-0.4	-1.2	-0.5
Mexico	2.0	0.4	1.3	-0.5	-0.6	-1.2	-0.6
Middle East and Central Asia	1.9	0.9	2.9	-0.5	-0.3	-0.9	-0.4
Saudi Arabia	2.4	0.2	2.2	-1.7	-0.8	-1.6	0.1
Sub-Saharan Africa	3.2	3.2	3.6	-0.2	0.0	-0.3	-0.1
Nigeria	1.9	2.3	2.5	0.0	-0.1	0.2	0.0
South Africa	0.8	0.7	1.1	0.0	0.0	-0.5	-0.4
<i>Memorandum</i>							
European Union	2.2	1.5	1.6	-0.1	-0.2	-0.1	-0.1
Low-Income Developing Countries	5.0	5.0	5.1	0.1	0.0	0.0	0.0
Middle East and North Africa	1.1	0.1	2.7	-0.6	-0.4	-1.2	-0.5
World Growth Based on Market Exchange Rates	3.1	2.5	2.7	-0.2	-0.2	-0.2	-0.2
<b>World Trade Volume (goods and services)</b>	<b>3.6</b>	<b>1.1</b>	<b>3.2</b>	<b>-1.4</b>	<b>-0.5</b>	<b>-2.3</b>	<b>-0.7</b>
Imports							
Advanced Economies	3.0	1.2	2.7	-1.0	-0.6	-1.8	-0.5
Emerging Market and Developing Economies	5.1	0.7	4.3	-2.2	-0.8	-3.9	-1.0
Exports							
Advanced Economies	3.1	0.9	2.5	-1.3	-0.4	-1.8	-0.6
Emerging Market and Developing Economies	3.9	1.9	4.1	-1.0	-0.5	-2.1	-0.7
<b>Commodity Prices (US dollars)</b>							
Oil <sup>6</sup>	29.4	-9.6	-6.2	-5.5	-3.7	3.8	-6.0
Nonfuel (average based on world commodity import weights)	1.6	0.9	1.7	1.5	1.2	1.1	0.6
<b>Consumer Prices</b>							
Advanced Economies	2.0	1.5	1.8	-0.1	-0.2	-0.1	-0.3
Emerging Market and Developing Economies <sup>7</sup>	4.8	4.7	4.8	-0.1	0.1	-0.2	0.1
<b>London Interbank Offered Rate (percent)</b>							
On US Dollar Deposits (six month)	2.5	2.3	2.0	-0.1	-0.3	-0.9	-1.8
On Euro Deposits (three month)	-0.3	-0.4	-0.6	-0.1	-0.3	-0.1	-0.4
On Japanese Yen Deposits (six month)	0.0	0.0	-0.1	0.0	-0.1	0.0	-0.1



	Year over Year				Q4 over Q4 <sup>b</sup>			
	2017	2018	Projections		2017	2018	Projections	
			2019	2020			2019	2020
<b>World Output</b>	<b>3.8</b>	<b>3.6</b>	<b>3.0</b>	<b>3.4</b>	<b>4.1</b>	<b>3.2</b>	<b>3.2</b>	<b>3.4</b>
<b>Advanced Economies</b>	<b>2.5</b>	<b>2.3</b>	<b>1.7</b>	<b>1.7</b>	<b>2.8</b>	<b>1.8</b>	<b>1.6</b>	<b>1.8</b>
United States	2.4	2.9	2.4	2.1	2.8	2.5	2.4	2.0
Euro Area	2.5	1.9	1.2	1.4	3.0	1.2	1.0	1.8
Germany <sup>2</sup>	2.5	1.5	0.5	1.2	3.4	0.6	0.4	1.3
France	2.3	1.7	1.2	1.3	3.0	1.2	1.0	1.3
Italy	1.7	0.9	0.0	0.5	1.7	0.0	0.2	1.0
Spain	3.0	2.6	2.2	1.8	3.1	2.3	2.0	1.8
Japan	1.9	0.8	0.9	0.5	2.4	0.3	0.3	1.2
United Kingdom	1.8	1.4	1.2	1.4	1.6	1.4	1.0	1.6
Canada	3.0	1.9	1.5	1.8	2.9	1.6	1.8	1.7
Other Advanced Economies <sup>3</sup>	2.9	2.6	1.6	2.0	3.0	2.2	1.7	2.1
<b>Emerging Market and Developing Economies</b>	<b>4.8</b>	<b>4.5</b>	<b>3.9</b>	<b>4.6</b>	<b>5.2</b>	<b>4.5</b>	<b>4.5</b>	<b>4.7</b>
Emerging and Developing Asia	6.6	6.4	5.9	6.0	6.8	6.0	6.0	5.9
China	6.8	6.6	6.1	5.8	6.7	6.4	6.0	5.7
India <sup>4</sup>	7.2	6.8	6.1	7.0	8.1	5.8	6.7	7.2
ASEAN-5 <sup>5</sup>	5.3	5.2	4.8	4.9	5.4	5.2	4.8	4.9
Emerging and Developing Europe	3.9	3.1	1.8	2.5	...	...	...	...
Russia	1.6	2.3	1.1	1.9	0.5	2.9	1.8	1.2
Latin America and the Caribbean	1.2	1.0	0.2	1.8	1.3	0.3	0.4	1.8
Brazil	1.1	1.1	0.9	2.0	2.2	1.1	1.2	2.3
Mexico	2.1	2.0	0.4	1.3	1.5	1.6	1.0	0.7
Middle East and Central Asia	2.3	1.9	0.9	2.9	...	...	...	...
Saudi Arabia	-0.7	2.4	0.2	2.2	-1.3	4.3	-0.9	3.0
Sub-Saharan Africa	3.0	3.2	3.2	3.6	...	...	...	...
Nigeria	0.8	1.9	2.3	2.5	...	...	...	...
South Africa	1.4	0.8	0.7	1.1	2.2	0.2	0.8	0.6
<i>Memorandum</i>								
European Union	2.8	2.2	1.5	1.6	3.0	1.7	1.3	1.8
Low-Income Developing Countries	4.7	5.0	5.0	5.1	...	...	...	...
Middle East and North Africa	1.8	1.1	0.1	2.7	...	...	...	...
World Growth Based on Market Exchange Rates	3.2	3.1	2.5	2.7	3.5	2.6	2.5	2.8
<b>World Trade Volume (goods and services)</b>	<b>5.7</b>	<b>3.6</b>	<b>1.1</b>	<b>3.2</b>	...	...	...	...
Imports								
Advanced Economies	4.7	3.0	1.2	2.7	...	...	...	...
Emerging Market and Developing Economies	7.5	5.1	0.7	4.3	...	...	...	...
Exports								
Advanced Economies	4.7	3.1	0.9	2.5	...	...	...	...
Emerging Market and Developing Economies	7.3	3.9	1.9	4.1	...	...	...	...
<b>Commodity Prices (US dollars)</b>								
Oil <sup>6</sup>	23.3	29.4	-9.6	-6.2	19.6	9.5	-3.8	-8.8
Nonfuel (average based on world commodity export weights)	6.4	1.6	0.9	1.7	3.5	-1.8	4.9	-1.0
<b>Consumer Prices</b>								
Advanced Economies	1.7	2.0	1.5	1.8	1.7	1.9	1.7	1.6
Emerging Market and Developing Economies <sup>7</sup>	4.3	4.8	4.7	4.8	3.7	4.2	4.1	4.0
<b>London Interbank Offered Rate (percent)</b>								
On US Dollar Deposits (six month)	1.5	2.5	2.3	2.0	...	...	...	...
On Euro Deposits (three month)	-0.3	-0.3	-0.4	-0.6	...	...	...	...
On Japanese Yen Deposits (six month)	0.0	0.0	0.0	-0.1	...	...	...	...

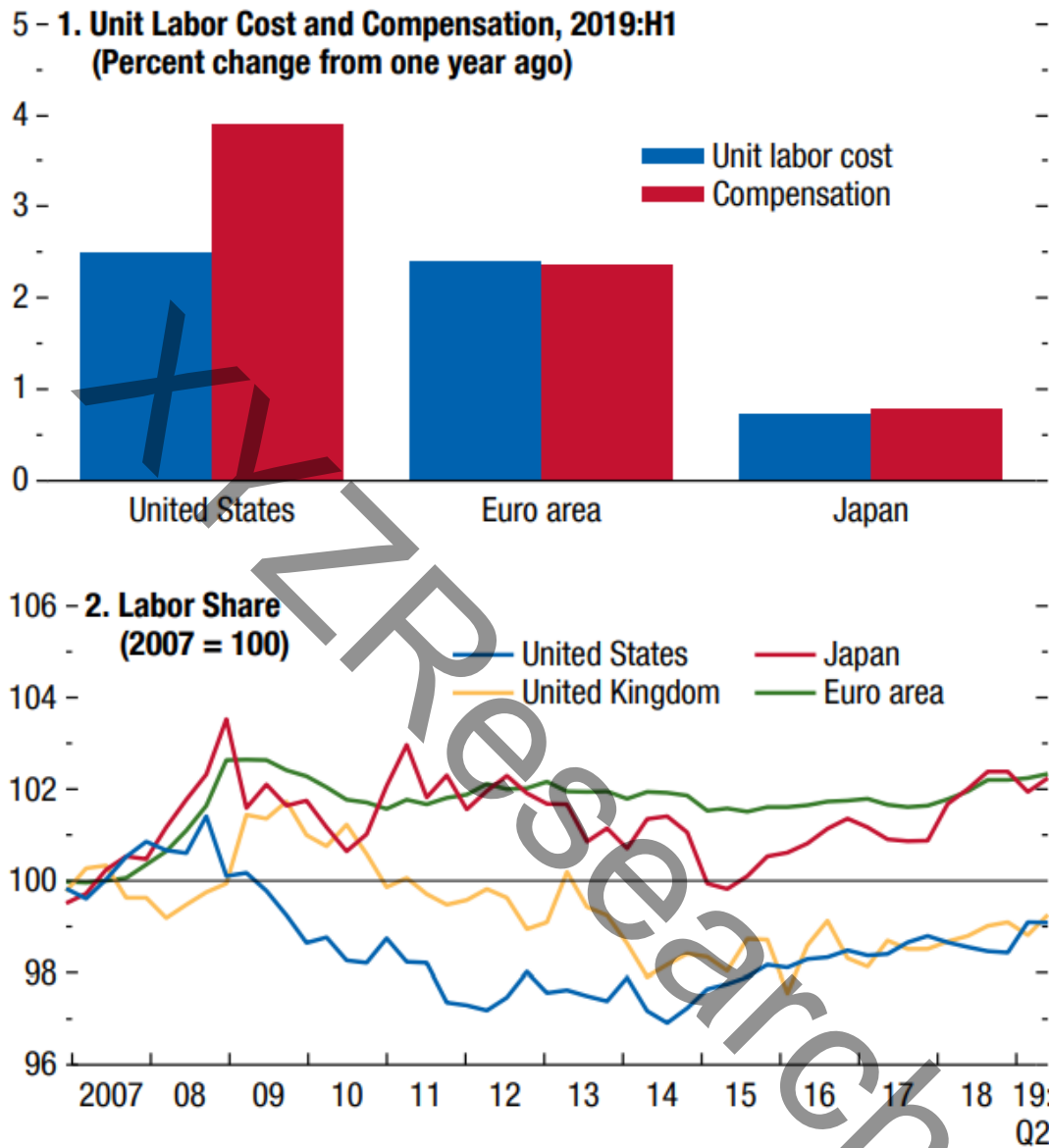
Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during July 26–August 23, 2019. Economies are listed on the basis of economic size. The aggregated quarterly data are seasonally adjusted. WEO = World Economic Outlook. Beginning with the October 2019 WEO, the regional group Commonwealth of Independent States (CIS) is discontinued. Four of the CIS economies (Belarus, Moldova, Russia, and Ukraine) are added to the regional group Emerging and Developing Europe. The remaining eight economies—Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan, which comprise the regional subgroup Caucasus and Central Asia (CCA)—are combined with Middle East, North Africa, Afghanistan, and Pakistan (MENAP) to form the new regional group Middle East and Central Asia (MECA).

The slowdown in global growth since 2017 and the projected pick up in 2020 reflects a major downturn



and projected recovery in a group of emerging market economies under severe distress.

Figure Wages, Unit Labor Costs, and Labor Shares



Sources: Haver Analytics; and IMF staff calculations.

**Growth Forecast for Advanced Economies**

For advanced economies, growth is projected to soften to 1.7 percent in 2019 and 2020. The forecast is 0.1 percentage point lower for 2019 than in the April 2019 WEO. • In the United States, the economy maintained momentum in the first half of the year. Although investment remained sluggish, employment and consumption were buoyant. Growth in 2019 is expected to be 2.4 percent, moderating to 2.1 percent in 2020. The projected moderation reflects an assumed shift in the fiscal stance from expansionary in 2019 to broadly neutral in 2020 as stimulus from the recently adopted two-year budget deal offsets the fading effects of the 2017 Tax Cuts and Jobs Act. Overall, the growth forecast is revised up from the April 2019 WEO (0.1 percentage point higher for 2019 and 0.2 for 2020). Revisions to past GDP data imply weaker carryover into 2019, and trade-related policy uncertainty imparts



further negative effects, but the two-year budget deal and the Federal Reserve's policy rate cuts yield net upward revisions.

- In the euro area, weaker growth in foreign demand and a drawdown of inventories (reflecting weak industrial production) have kept a lid on growth since mid-2018. Activity is expected to pick up only modestly over the remainder of this year, and into 2020, as external demand is projected to regain some momentum and temporary factors (including new emission standards that hit German car production) continue to fade. Growth is projected at 1.2 percent in 2019 (0.1 percentage point lower than in April) and 1.4 percent in 2020. The 2019 forecast is revised down slightly for France and Germany (due to weaker-than-expected external demand in the first half of the year). Both the 2019 and 2020 forecasts were marked down for Italy, owing to softening private consumption, a smaller fiscal impulse, and a weaker external environment. The outlook is also slightly weaker for Spain, with growth projected to slow gradually from 2.6 percent in 2018 to 2.2 percent in 2019 and 1.8 percent in 2020 (0.1 percentage point lower than in April).

- The United Kingdom is set to expand at 1.2 percent in 2019 and 1.4 percent in 2020. The unchanged projection for both years (relative to the April 2019 WEO) reflects the combination of a negative impact from weaker global growth and ongoing Brexit uncertainty and a positive impact from higher public spending announced in the recent Spending Review. The economy contracted in the second quarter, and recent indicators point to weak growth in the third quarter. The forecast assumes an orderly exit from the European Union followed by a gradual transition to the new regime. However, as of early September, the ultimate form of Brexit remains highly uncertain.

- Japan's economy is projected to grow by 0.9 percent in 2019 (0.1 percentage point lower than anticipated in the April 2019 WEO). Strong private consumption and public spending in the first half of 2019 outweighed continued weakness in the external sector. Growth is projected at 0.5 percent in 2020 (unchanged from the April 2019 WEO), with temporary fiscal measures expected to cushion part of the anticipated decline in private consumption following the October 2019 increase in the consumption tax rate.

Beyond 2020, growth in the advanced economy group is projected to stabilize at about 1.6 percent, similar to the April 2019 WEO forecast. A modest uptick expected in productivity is projected to counteract the drag on potential output growth from slower labor force growth as populations continue to age.

#### **Growth Forecast for Emerging Market and Developing Economies**

Growth in the emerging market and developing economy group is expected to bottom out at 3.9 percent in 2019, rising to 4.6 percent in 2020. The forecasts for 2019 and 2020 are 0.5 percentage point and 0.2 percentage point lower, respectively, than in April, reflecting downward revisions in all major regions except emerging and developing Europe.

- Emerging and Developing Asia remains the main engine of the world economy, but growth is softening gradually with the structural slowdown in China. Output in the region is expected to grow at 5.9 percent this year and at 6.0 percent in 2020 (0.4 and 0.3 percentage point lower, respectively, than in the April 2019 WEO forecast). In China, the effects of escalating tariffs and weakening external demand have



exacerbated the slowdown associated with needed regulatory strengthening to rein in the accumulation of debt. With policy stimulus expected to continue supporting activity in the face of the adverse external shock, growth is forecast at 6.1 percent in 2019 and 5.8 percent in 2020—0.2 and 0.3 percentage point lower than in the April 2019 WEO projection. India's economy is set to grow at 6.1 percent in 2019, picking up to 7 percent in 2020. The downward revision relative to the April 2019 WEO of 1.2 percentage points for 2019 and 0.5 percentage point for 2020 reflects a weaker-than-expected outlook for domestic demand. Growth will be supported by the lagged effects of monetary policy easing, a reduction in corporate income tax rates, recent measures to address corporate and environmental regulatory uncertainty, and government programs to support rural consumption.

- Subdued growth in emerging and developing Europe in 2019 largely reflects a slowdown in Russia and flat activity in Turkey. The region is expected to grow at 1.8 percent in 2019 and 2.5 percent in 2020. The upward revision to 2019 growth relative to the April 2019 forecast reflects a shallower-than-expected downturn in Turkey in the first half of the year as a result of fiscal support. In Russia, by contrast, growth has been weaker this year than forecast in April, but is projected to recover next year, contributing to the upward revision to projected 2020 growth for the region. Several countries in central and eastern Europe, including Hungary and Poland, are experiencing solid growth on the back of resilient domestic demand and rising wages.

- In Latin America, activity slowed notably at the start of the year across the larger economies, mostly reflecting idiosyncratic factors. Growth in the region is now expected at 0.2 percent this year (1.2 percentage point lower than in the April 2019 WEO). The sizable downward revision for 2019 reflects downgrades to Brazil (where mining supply disruptions have hurt activity) and Mexico (where investment remains weak and private consumption has slowed, reflecting policy uncertainty, weakening confidence, and higher borrowing costs). Argentina's economy is expected to contract further in 2019 on lower confidence and tighter external financing conditions. Chile's growth projection is revised down, following weaker-than-expected performance at the start of the year. The deep humanitarian crisis and economic implosion in Venezuela continue to have a devastating impact, with the economy expected to shrink by about one-third in 2019. For the region as a whole, growth is expected to firm up to 1.8 percent in 2020 (0.6 percentage point lower than in the April forecast). The projected strengthening reflects expected recovery in Brazil (on the back of accommodative monetary policy) and in Mexico (as uncertainty gradually subsides), together with less severe contractions for 2020 compared to this year in Argentina and Venezuela.

- Growth in the Middle East and Central Asia region is expected to be 0.9 percent in 2019, rising to 2.9 percent in 2020. The forecast is 0.9 and 0.4 percentage point lower, respectively, than in the April 2019 WEO, largely due to the downward forecast revision for Iran (owing to the effect of tighter US sanctions) and Saudi Arabia. While non-oil growth is expected to strengthen in 2019 on higher government spending and confidence, oil GDP in Saudi Arabia is projected to decline against the backdrop of the extension of the OPEC+ agreement and a generally weak global oil market. The impact on growth of the recent attacks on Saudi Arabia's oil facilities is difficult to gauge at this stage but adds uncertainty to the near-term outlook. Growth is projected to pick up in 2020 as oil GDP stabilizes and solid momentum in the non-oil sector continues. Civil strife in some other economies, including Libya, Syria, and Yemen, weigh on the region's outlook.





- In sub-Saharan Africa, growth is expected at 3.2 percent in 2019 and 3.6 percent in 2020, slightly lower for both years than in the April 2019 WEO. Higher, albeit volatile, oil prices earlier in the year have supported the subdued outlook for Nigeria and some other oil-exporting countries in the region, but Angola's economy—because of a decline in oil production—is expected to contract this year and recover only mildly next year. In South Africa, despite a moderate rebound in the second quarter, growth is expected to be weaker in 2019 than projected in the April 2019 WEO following a very weak first quarter, reflecting a larger-than-anticipated impact of labor strikes and energy supply issues in mining, together with weak agricultural production. While the three largest economies of the region are projected to continue their lackluster performance, many other economies—typically more diversified ones—are experiencing solid growth. About 20 economies in the region, accounting for about 45 percent of the sub-Saharan African population and 34 percent of the region's GDP (1 percent of global GDP), are estimated to be growing faster than 5 percent this year while growth in a somewhat larger set of countries, in per capita terms, is faster than in advanced economies.

Over the medium term, growth for the emerging market and developing economies group is projected to stabilize at about 4.8 percent, but with important differences across regions. In emerging and developing Asia, it is expected to remain at about 6 percent through the forecast horizon. This smooth growth profile rests on a gradual slowdown in China to 5.5 percent by 2024 and firming and stabilization of growth in India at about 7.3 percent over the medium term, based on continued implementation of structural reforms. In Latin America, growth is projected to increase from the 1.8 percent projected for 2020, but remain below 3 percent over the medium term as structural rigidities, subdued terms of trade, and fiscal imbalances (particularly for Brazil) weigh on the outlook. Activity in emerging and developing Europe is projected to pick up from its current post-global-financial-crisis low, with the region expected to grow at about 2½ percent over the medium term. Prospects vary across sub-Saharan Africa, but growth for the region as a whole is projected to increase from 3.6 percent in 2020 to 4.2 percent in 2024 (although for close to two-fifths of economies, the average growth rate over the medium term is projected to exceed 5 percent). The medium-term outlook for the Middle East and Central Asia region is largely shaped by the outlook for fuel prices, needed adjustment to correct macroeconomic imbalances in certain economies, and geopolitical tensions. Forty emerging market and developing economies (about a quarter of the total) are projected to grow in per capita terms above the 3.3 percent weighted average of the group, which is more than 2 percentage points above the average for advanced economies (Figure 1.15). For these economies—which include China, India, and Indonesia—the challenge is to ensure that these growth rates materialize and that the benefits of growth are shared widely. Convergence prospects are instead bleak for some emerging market and developing economies. Across sub-Saharan Africa and in the Middle East and Central Asia region, 47 economies, accounting for about 10 percent of global GDP in purchasing-power-parity terms and close to 1 billion in population, are projected to grow by less than advanced economies in per capita terms.



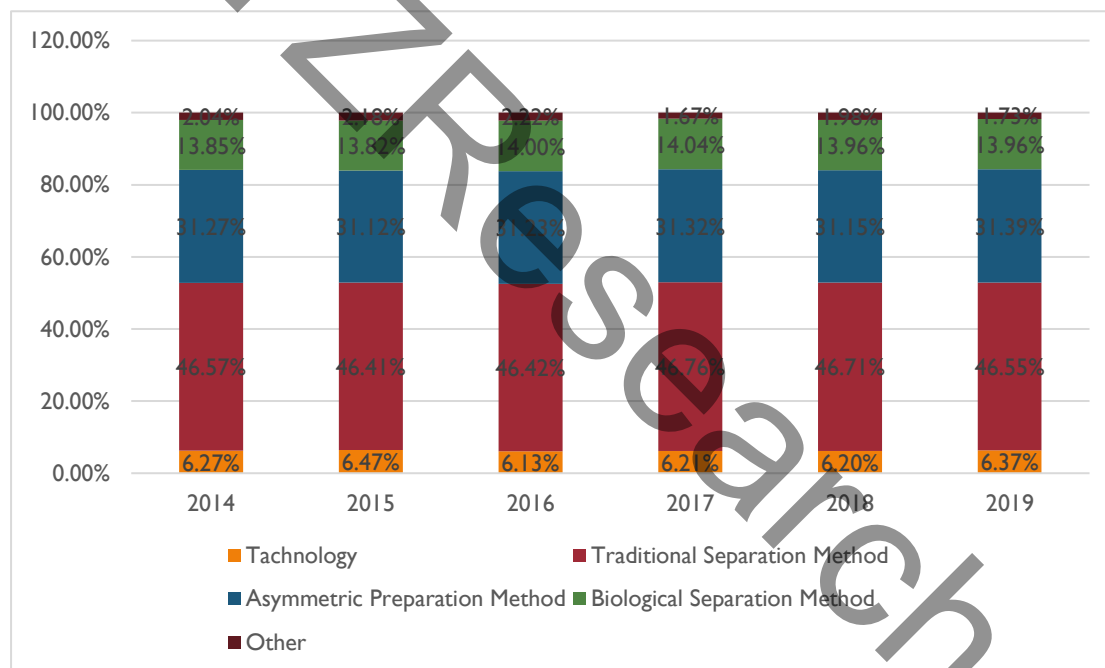
## 3 World Chiral Chemicals Market Assessment by Type

Table World Chiral Chemicals Revenue (Million USD) by Type (2014-2019)

	2014	2015	2016	2017	2018	2019
Tachnology	2001	2267	2378	2680	3019	3434
Traditional Separation Method	14862	16265	18009	20178	22745	25093
Asymmetric Preparation Method	9979	10906	12116	13515	15168	16921
Biological Separation Method	4420	4843	5431	6059	6798	7525
Other	651	764	861	720	964	933
<b>Total</b>	<b>31913</b>	<b>35046</b>	<b>38795</b>	<b>43152</b>	<b>48693</b>	<b>53906</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure World Chiral Chemicals Revenue Share (%) by Type (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 3.1 Tachnology Sales and Revenue

Table Revenue (Million USD) and Growth Rate (2014-2019)

	2014	2015	2016	2017	2018	2019
Sales Revenue (Million USD)	2001	2267	2378	2680	3019	3434
Growth Rate		13.29%	4.90%	12.70%	12.65%	13.75%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



### 3.2 Traditional Separation Method-Sales and Revenue

Table Revenue (Million USD) and Growth Rate (2014-2019)

	2014	2015	2016	2017	2018	2019
Revenue	14862	16265	18009	20178	22745	25093
Growth Rate		9.44%	10.72%	12.04%	12.72%	10.32%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 3.3 Asymmetric Preparation Method-Sales and Revenue

Table Revenue (Million USD) and Growth Rate (2014-2019)

	2014	2015	2016	2017	2018	2019
Revenue	9979	10906	12116	13515	15168	16921
Growth Rate		9.29%	11.09%	11.55%	12.23%	11.56%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 3.4 Biological Separation Method-Sales and Revenue

Table Revenue (Million USD) and Growth Rate (2014-2019)

	2014	2015	2016	2017	2018	2019
Revenue	4420	4843.4	5431.3	6058.5	6797.5	7525.3
Growth Rate		9.58%	12.14%	11.55%	12.20%	10.71%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 3.5 Others-Sales and Revenue

Table Revenue (Million USD) and Growth Rate (2014-2019)

	2014	2015	2016	2017	2018	2019
Revenue	650.8	764.3	861	720.3	963.6	932.6
Growth Rate		17.44%	12.65%	-16.34%	33.78%	-3.22%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



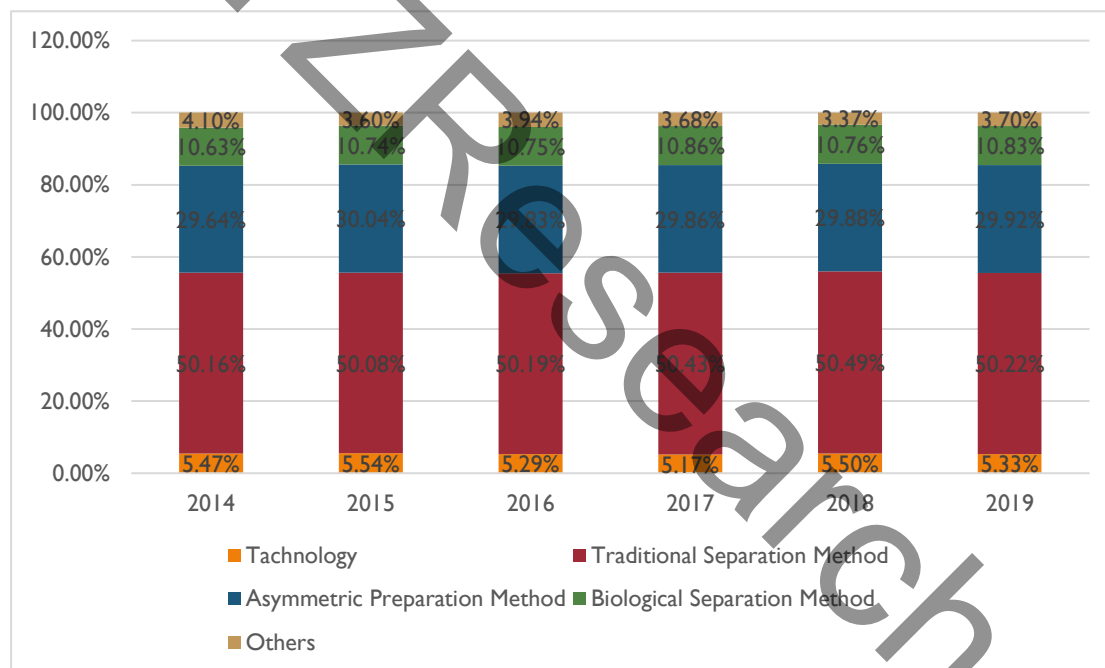
## 4 Asia Pacific Chiral Chemicals Market Assessment by Type

Table Asia Pacific Chiral Chemicals Revenue (Million USD) by Type (2014-2019)

	2014	2015	2016	2017	2018	2019
Tachnology	436	484	512	556	668	717
Traditional Separation Method	3998	4376	4859	5420	6137	6758
Asymmetric Preparation Method	2362	2625	2888	3209	3632	4026
Biological Separation Method	847	939	1041	1167	1308	1457
Others	327	315	381	396	410	498
<b>Total</b>	<b>7970</b>	<b>8739</b>	<b>9682</b>	<b>10748</b>	<b>12154</b>	<b>13457</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure Asia Pacific Chiral Chemicals Revenue Share (%) by Type (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



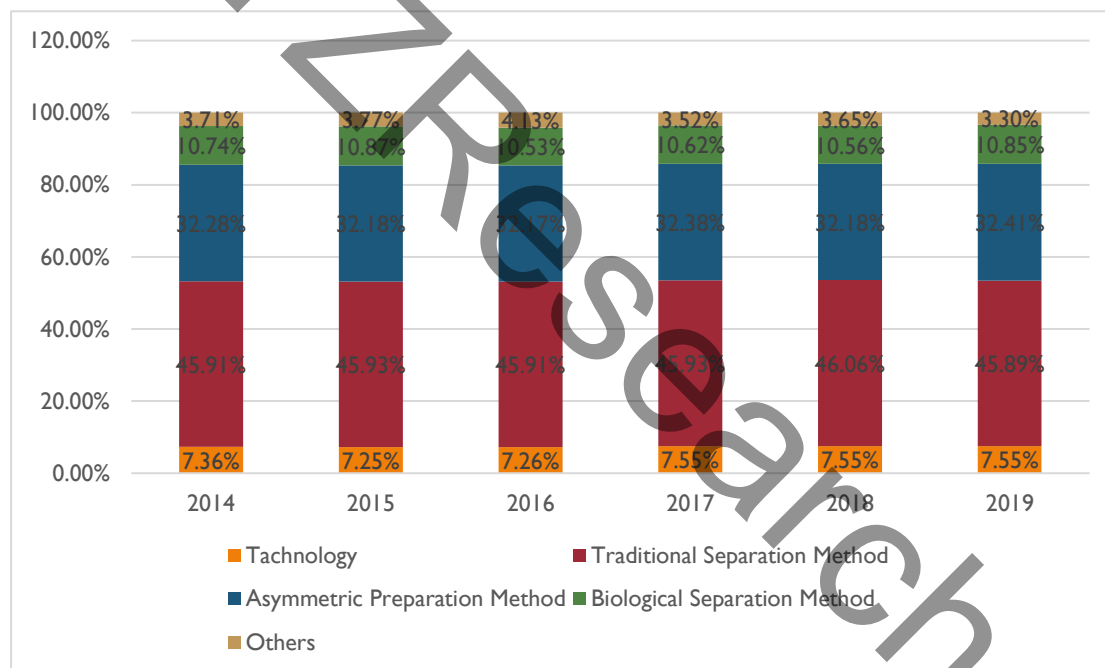
## 5 North America Chiral Chemicals Market Assessment by Type

Table North America Chiral Chemicals Revenue (Million USD) by Type (2014-2019)

	2014	2015	2016	2017	2018	2019
Tachnology	849	918	1017	1178	1332	1470
Traditional Separation Method	5295	5813	6433	7165	8125	8934
Asymmetric Preparation Method	3723	4073	4508	5051	5677	6310
Biological Separation Method	1239	1376	1476	1657	1863	2112
Others	428	477	579	549	644	642
Total	11533	12656	14013	15600	17640	19468

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure North America Chiral Chemicals Revenue Share (%) by Type (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



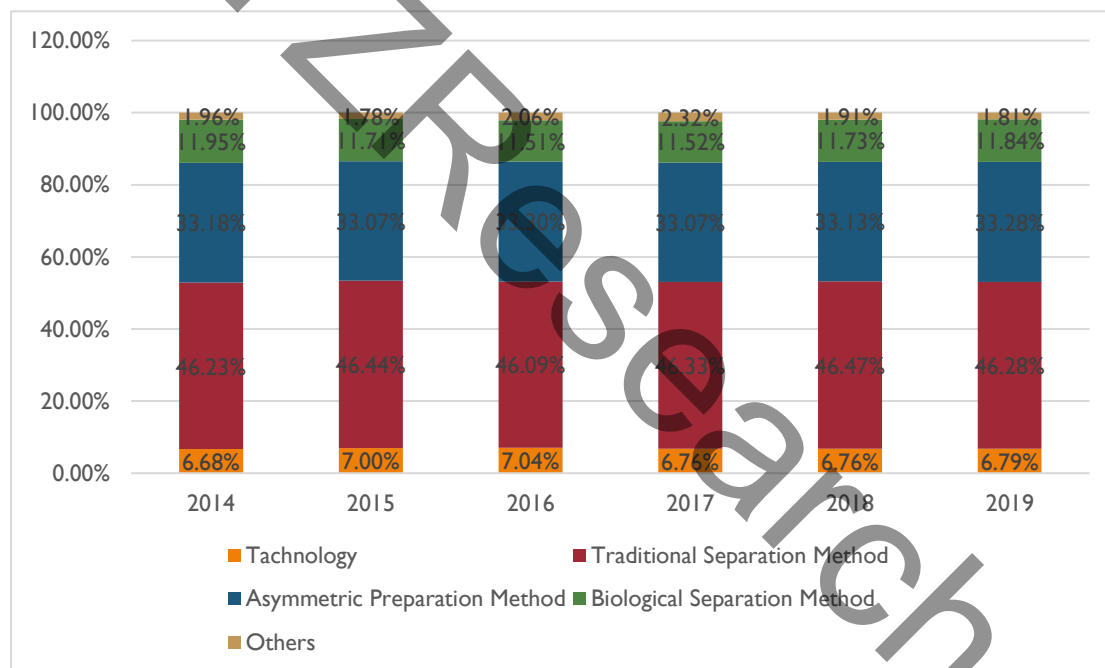
## 6 Europe Chiral Chemicals Market Assessment by Type

Table Europe Chiral Chemicals Revenue (Million USD) by Type (2014-2019)

	2014	2015	2016	2017	2018	2019
Tachnology	627	722	804	862	973	1084
Traditional Separation Method	4336	4792	5266	5908	6686	7385
Asymmetric Preparation Method	3112	3412	3805	4217	4767	5311
Biological Separation Method	1121	1208	1315	1469	1688	1889
Others	184	184	235	296	275	289
Total	9380	10319	11425	12751	14388	15958

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure Europe Chiral Chemicals Revenue Share (%) by Type (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



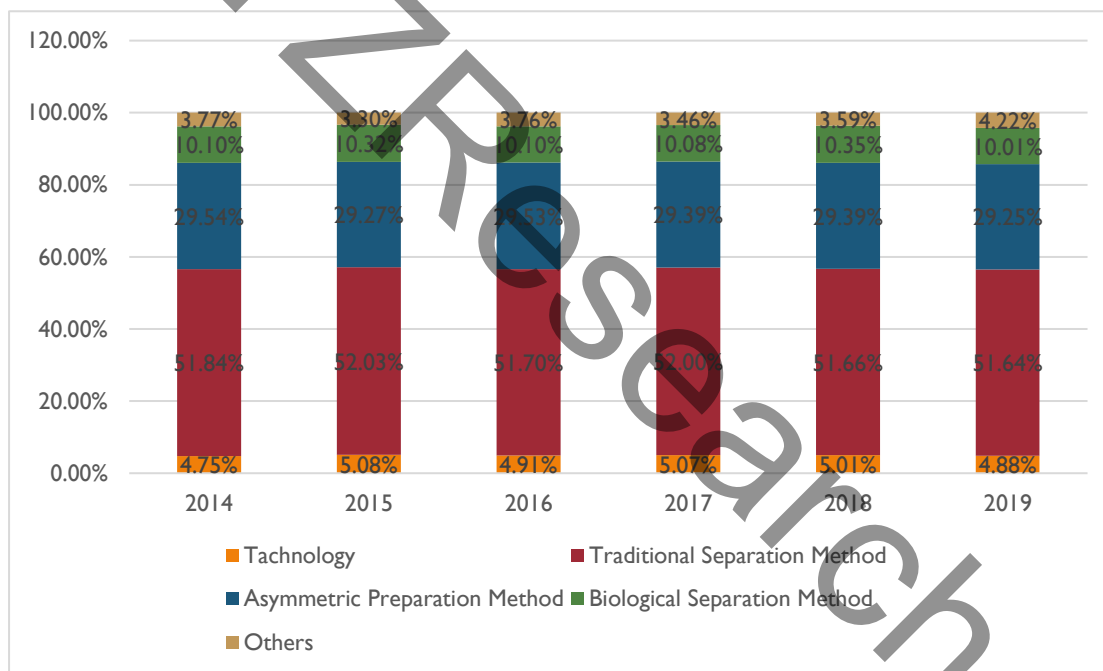
## 7 South America Chiral Chemicals Market Assessment by Type

Table South America Chiral Chemicals Revenue (Million USD) by Type (2014-2019)

	2014	2015	2016	2017	2018	2019
Tachnology	66	76	82	93	104	112
Traditional Separation Method	719	781	861	959	1071	1182
Asymmetric Preparation Method	410	440	492	542	609	670
Biological Separation Method	140	155	168	186	215	229
Others	52	50	63	64	74	97
<b>Total</b>	<b>1387</b>	<b>1502</b>	<b>1666</b>	<b>1844</b>	<b>2073</b>	<b>2289</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure South America Chiral Chemicals Revenue Share (%) by Type (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



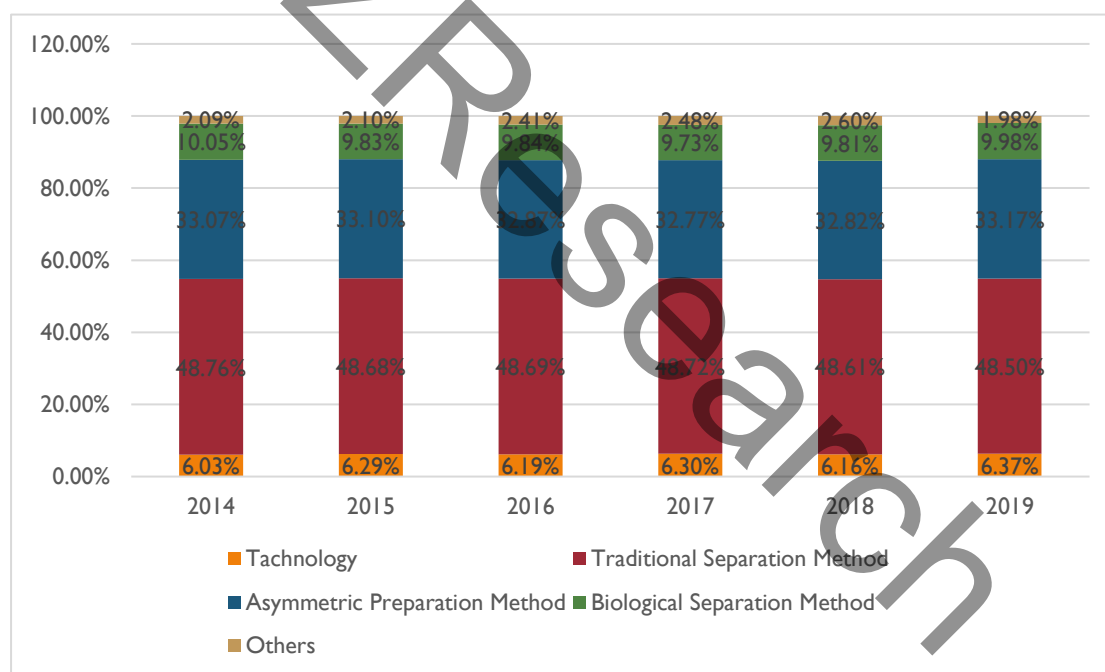
## 8 Middle East and Africa Chiral Chemicals Market Assessment by Type

Table Middle East and Africa Chiral Chemicals Revenue (Million USD) by Type (2014-2019)

	2014	2015	2016	2017	2018	2019
Tachnology	99	115	124	139	150	174
Traditional Separation Method	801	891	978	1076	1185	1326
Asymmetric Preparation Method	543	606	660	724	800	907
Biological Separation Method	165	180	198	215	239	273
Others	34	38	48	55	63	54
<b>Total</b>	<b>1643</b>	<b>1830</b>	<b>2009</b>	<b>2209</b>	<b>2438</b>	<b>2734</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure Middle East and Africa Chiral Chemicals Revenue Share (%) by Type (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019





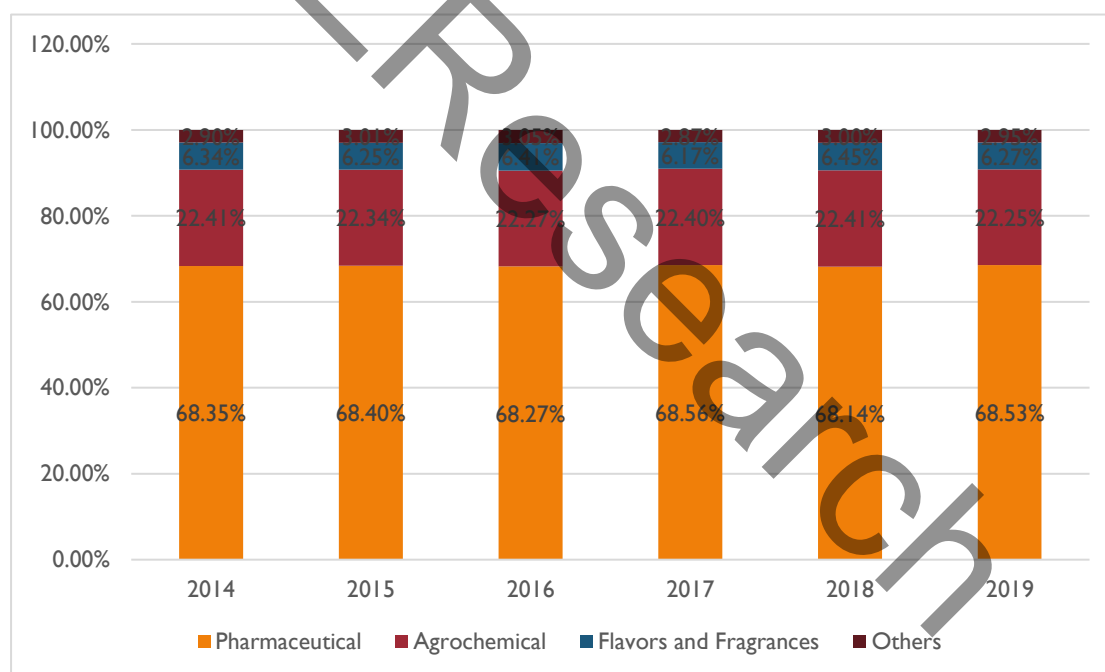
## 9 World Chiral Chemicals Market Assessment by Application

Table World Chiral Chemicals Consumption Value (Million USD) by Application (2014-2019)

	2014	2015	2016	2017	2018	2019
Pharmaceutical	21813	23971	26485	29585	33179	36942
Agrochemical	7152	7829	8640	9666	10912	11994
Flavors and Fragrances	2023	2190	2487	2663	3141	3380
Others	925	1056	1183	1239	1461	1590
<b>Total</b>	<b>31913</b>	<b>35046</b>	<b>38795</b>	<b>43152</b>	<b>48693</b>	<b>53906</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure World Chiral Chemicals Consumption Market Share (%) by Application (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



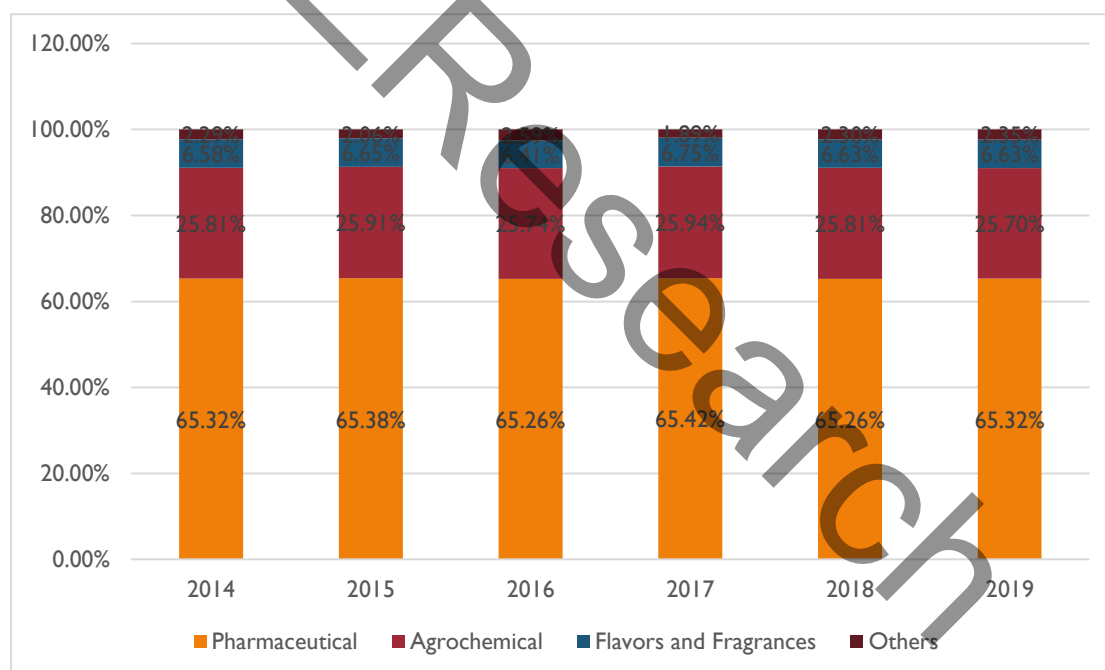
## 9.1 Asia Pacific Chiral Chemicals Market Assessment by Application

Table Asia Pacific Chiral Chemicals Consumption Value (Million USD) by Application (2014-2019)

	2014	2015	2016	2017	2018	2019
Pharmaceutical	5206	5714	6318	7031	7932	8790
Agrochemical	2057	2264	2492	2788	3137	3458
Flavors and Fragrances	524	581	621	725	806	892
Others	183	180	251	203	280	316
<b>Total</b>	<b>7970</b>	<b>8739</b>	<b>9682</b>	<b>10748</b>	<b>12154</b>	<b>13457</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure Asia Pacific Chiral Chemicals Consumption Market Share (%) by Application (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



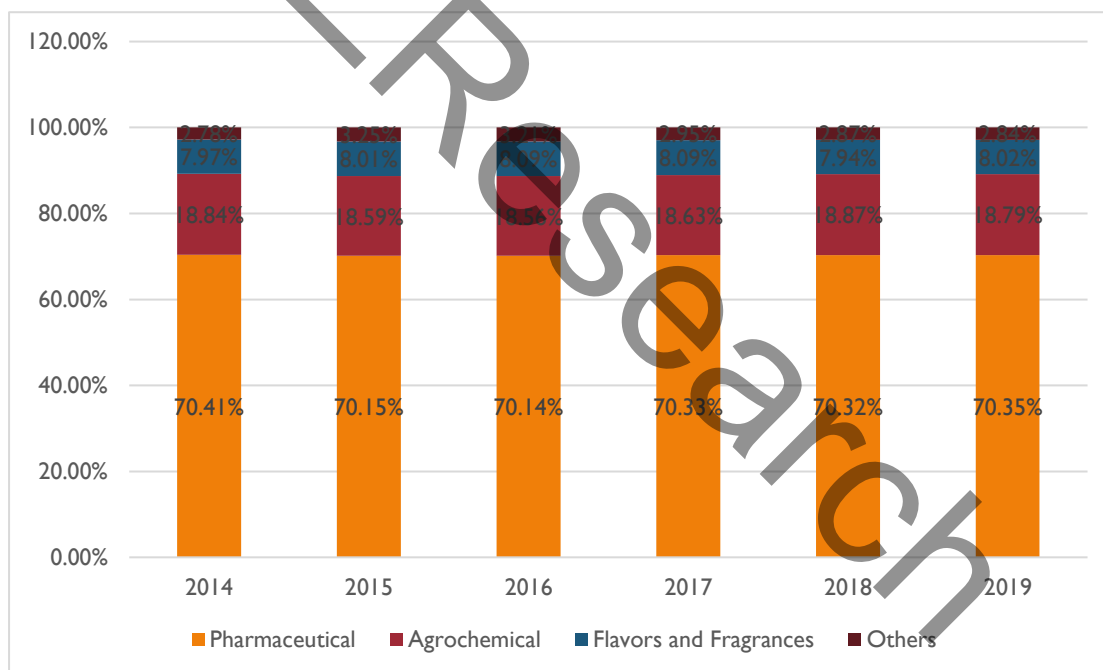
## 9.2 North America Chiral Chemicals Market Assessment by Application

Table North America Chiral Chemicals Consumption Value (Million USD) by Application (2014-2019)

	2014	2015	2016	2017	2018	2019
Pharmaceutical	8120	8878	9829	10971	12404	13696
Agrochemical	2173	2353	2601	2906	3329	3658
Flavors and Fragrances	919	1014	1134	1262	1401	1561
Others	321	411	450	460	506	553
<b>Total</b>	<b>11533</b>	<b>12656</b>	<b>14013</b>	<b>15600</b>	<b>17640</b>	<b>19468</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure North America Chiral Chemicals Consumption Market Share (%) by Application (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



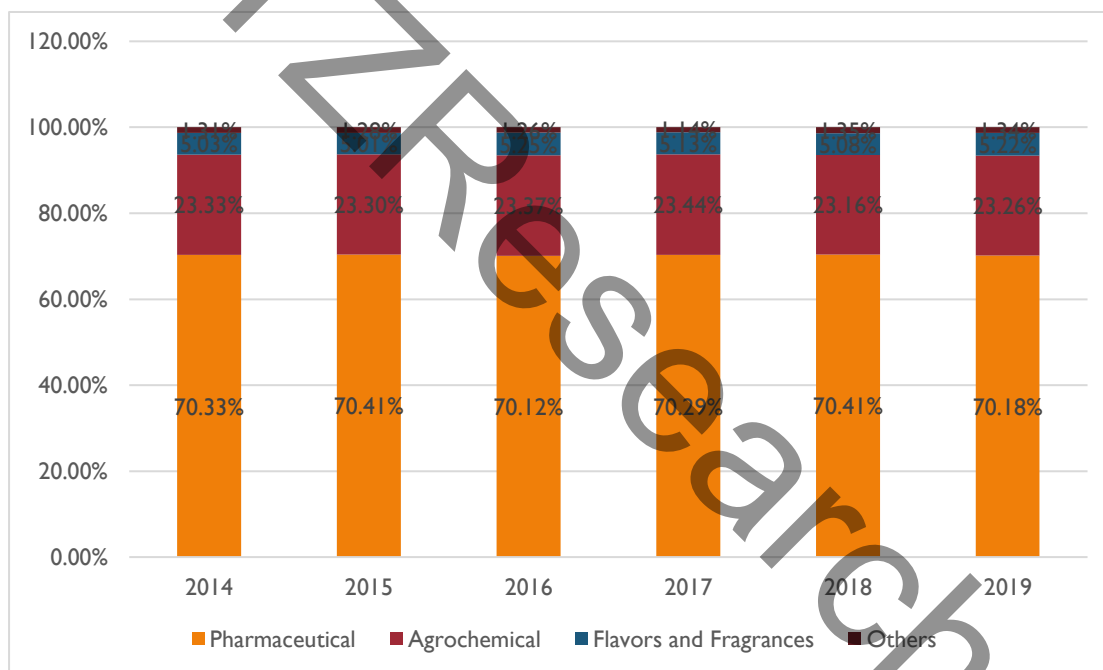
### 9.3 Europe Chiral Chemicals Market Assessment by Application

Table Europe Chiral Chemicals Consumption Value (Million USD) by Application (2014-2019)

	2014	2015	2016	2017	2018	2019
Pharmaceutical	6597	7266	8011	8963	10131	11199
Agrochemical	2188	2404	2670	2989	3332	3712
Flavors and Fragrances	472	517	600	654	731	833
Others	123	132	144	145	194	214
<b>Total</b>	<b>9380</b>	<b>10319</b>	<b>11425</b>	<b>12751</b>	<b>14388</b>	<b>15958</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure Europe Chiral Chemicals Consumption Market Share (%) by Application (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



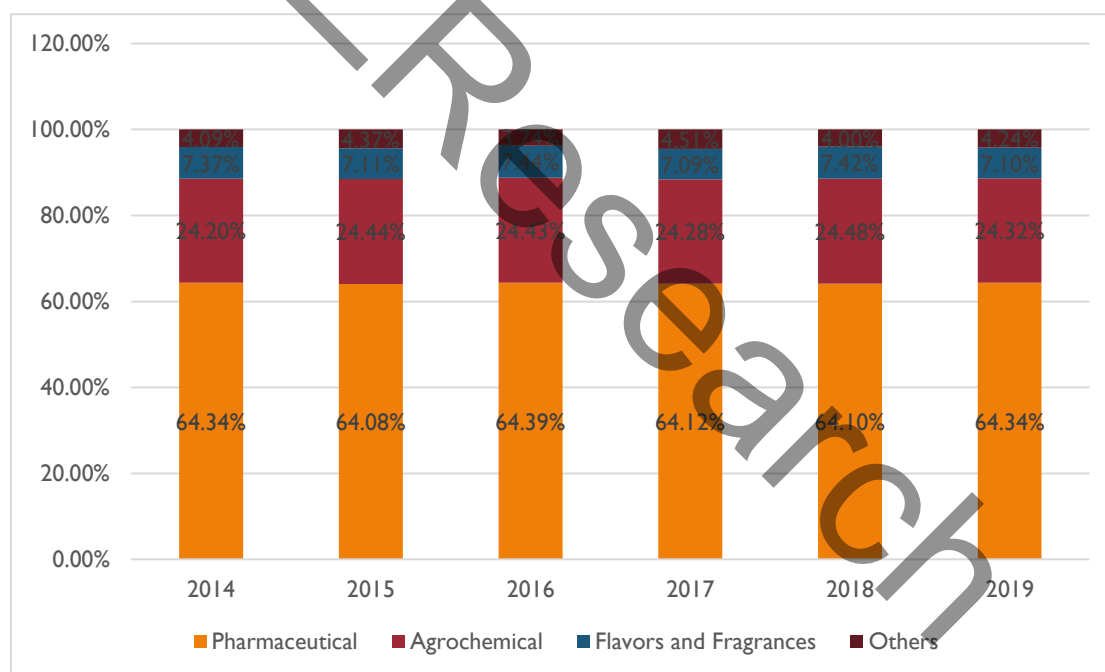
## 9.4 South America Chiral Chemicals Market Assessment by Application

Table South America Chiral Chemicals Consumption Value (Million USD) by Application (2014-2019)

	2014	2015	2016	2017	2018	2019
Pharmaceutical	892	962	1073	1182	1329	1473
Agrochemical	336	367	407	448	507	557
Flavors and Fragrances	102	107	124	131	154	163
Others	57	66	62	83	83	97
Total	1387	1502	1666	1844	2073	2289

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure South America Chiral Chemicals Consumption Market Share (%) by Application (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



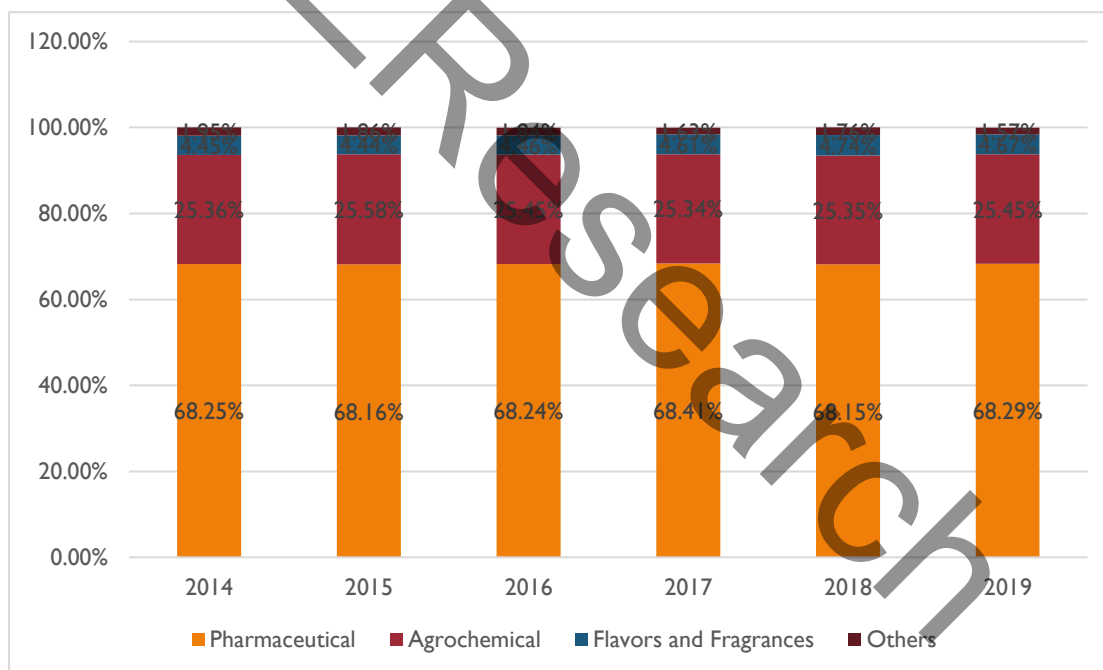
## 9.5 Middle East and Africa Chiral Chemicals Market Assessment by Application

Table Middle East and Africa Chiral Chemicals Consumption Value (Million USD) by Application (2014-2019)

	2014	2015	2016	2017	2018	2019
Pharmaceutical	1121	1247	1371	1511	1661	1867
Agrochemical	417	468	511	560	618	696
Flavors and Fragrances	73	81	90	102	116	128
Others	32	34	37	36	43	43
<b>Total</b>	<b>1643</b>	<b>1830</b>	<b>2009</b>	<b>2209</b>	<b>2438</b>	<b>2734</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure North America Chiral Chemicals Consumption Market Share (%) by Application (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10 Company Profiles/Analysis

### 10.1 BASF

#### 10.1.1 Overview

Table BASF Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="http://www.intermediates.basf.com/chemicals/chiral-intermediates/index">http://www.intermediates.basf.com/chemicals/chiral-intermediates/index</a>
3	Manufacturing Locations of Chiral Chemicals	Germany
4	Sales Regions	Global
5	Competitors	Dow

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

#### 10.1.2 Product Portfolio

Figure BASF Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019




### 10.1.3 BASF Chiral Chemicals Business Performance

## 10.2 Dow

### 10.2.1 Overview

Table Dow Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.dow.com/en-us.html">https://www.dow.com/en-us.html</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	W. R. Grace

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 10.2.2 Product Portfolio

Figure Dow Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 10.2.3 Dow Chiral Chemicals Business Performance

## 10.3 Solvias


### 10.3.1 Overview

Table Solvias Profiles

#	Item	Description
---	------	-------------



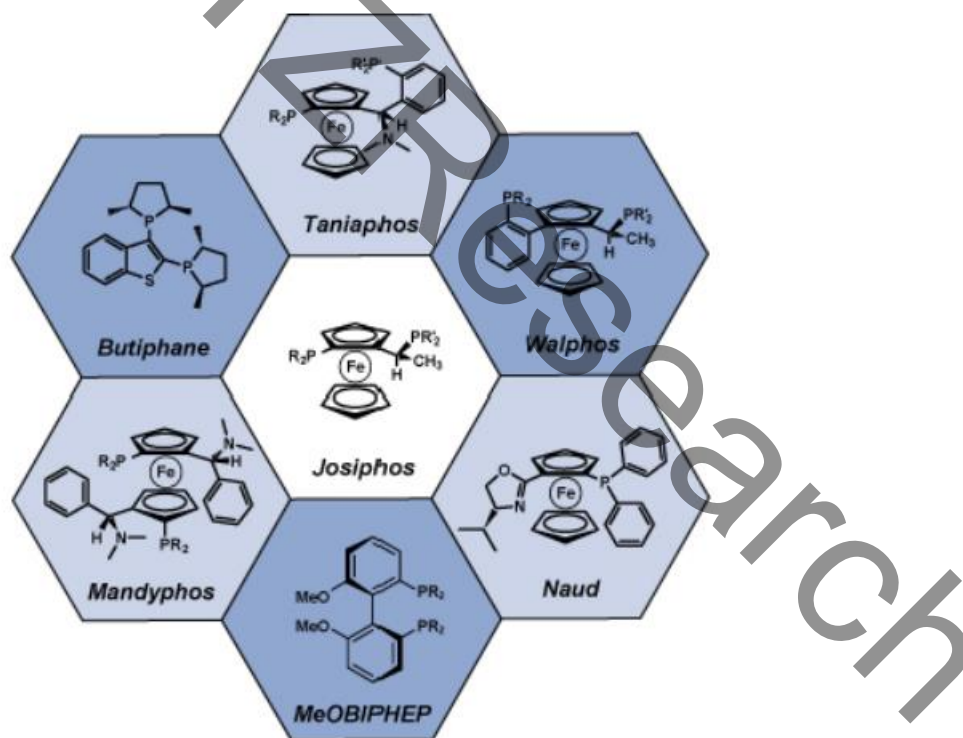


1	Company Logo	
2	Website	<a href="https://www.solvias.com/en/home/">https://www.solvias.com/en/home/</a>
3	Manufacturing Locations of Chiral Chemicals	Switzerland
4	Sales Regions	Global
5	Competitors	Bachem

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 10.3.2 Product Portfolio

Figure Solvias Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019




### 10.3.3 Solvias Chiral Chemicals Business Performance

## 10.4 Johnson

### 10.4.1 Overview

Table Johnson Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://matthey.com/en/about-us">https://matthey.com/en/about-us</a>
3	Manufacturing Locations of Chiral Chemicals	UK
4	Sales Regions	Global
5	Competitors	W. R. Grace

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 10.4.2 Product Portfolio

Figure Johnson Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019




### 10.4.3 Johnson Chiral Chemicals Business Performance

## 10.5 W. R. Grace

### 10.5.1 Overview

Table W. R. Grace Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://grace.com/pharma-and-biotech/en-us/fine-chemicals">https://grace.com/pharma-and-biotech/en-us/fine-chemicals</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Thermo Fisher Scientific

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 10.5.2 Product Portfolio

Figure W. R. Grace Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 10.5.3 W. R. Grace Chiral Chemicals Business Performance


## 10.6 Thermo Fisher Scientific

### 10.6.1 Overview

Table Thermo Fisher Scientific Profiles

#	Item	Description
---	------	-------------



1	Company Logo	
2	Website	<a href="https://www.sigmaaldrich.com/chemistry/chemical-synthesis/chiral-chemistry.html">https://www.sigmaaldrich.com/chemistry/chemical-synthesis/chiral-chemistry.html</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Agilent

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.6.2 Product Portfolio

Figure Thermo Fisher Scientific Product Information

### Asymmetric Synthesis

- [Chiral Auxiliaries](#)
- [Chiral Building Blocks](#)
- [Chiral Catalysts, Ligands and Reagents](#)
- [Privileged Ligands and Complexes](#)

### Newsletter

- [Chiral e-Times](#)

### Chiral resolution and Separation

- [Chiral Derivatization Reagents](#)
- [Chiral HPLC and GC Columns](#)
- [Chiral Resolution Reagents](#)
- [Chiral Mobile Phase Additives](#)

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.6.3 Thermo Fisher Scientific Chiral Chemicals Business Performance

## 10.7 Agilent

### 10.7.1 Overview

Table Agilent Profiles

#	Item	Description
1	Company Logo	



2	Website	<a href="https://www.agilent.com/zh-cn/solutions/specialty-chemicals/basic-fine-chemicals">https://www.agilent.com/zh-cn/solutions/specialty-chemicals/basic-fine-chemicals</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Albemarle

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.7.2 Product Portfolio

Figure Agilent Product Information




Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.7.3 Agilent Chiral Chemicals Business Performance

## 10.8 Albemarle

### 10.8.1 Overview

Table Albemarle Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.albcustom.com/">https://www.albcustom.com/</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Beckman

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.8.2 Product Portfolio

Figure Albemarle Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.8.3 Albemarle Chiral Chemicals Business Performance

## 10.9 Alps Pharmaceutical

### 10.9.1 Overview

Table Alps Pharmaceutical Profiles

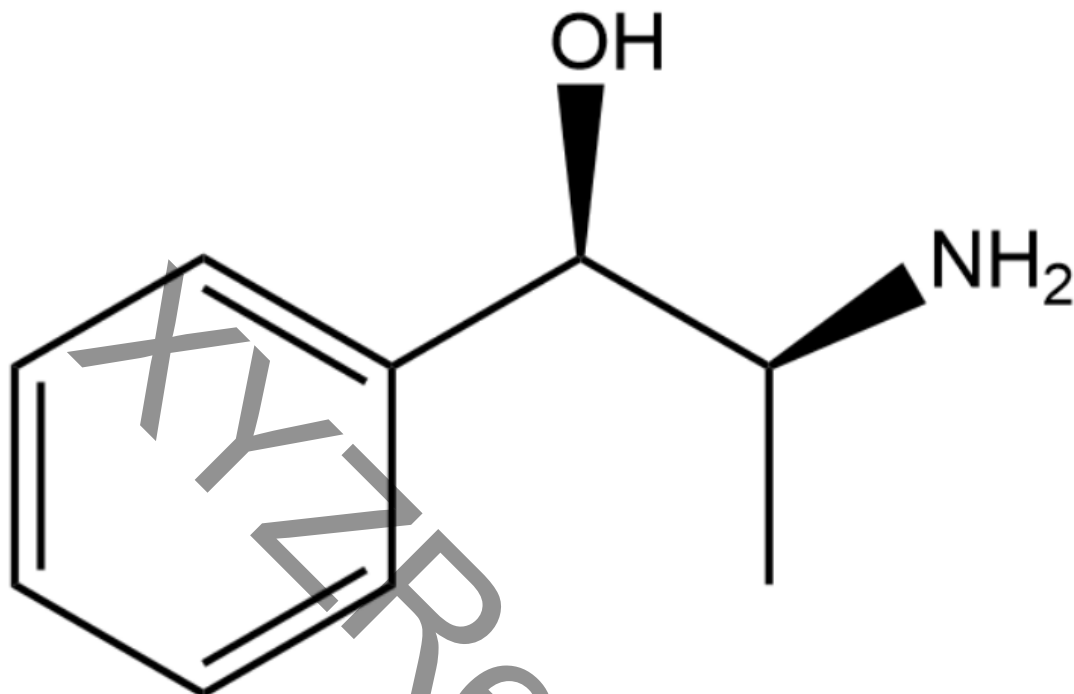
#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.alps-pharm.co.jp/english/product/?s=Chiral">https://www.alps-pharm.co.jp/english/product/?s=Chiral</a>
3	Manufacturing Locations of Chiral Chemicals	Japan
4	Sales Regions	Global
5	Competitors	Daicel Corporation

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.9.2 Product Portfolio

Figure Alps Pharmaceutical Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.9.3 Alps Pharmaceutical Chiral Chemicals Business Performance

### 10.10 Bachem

#### 10.10.1 Overview

Table Bachem Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.bachem.com/">https://www.bachem.com/</a>
3	Manufacturing Locations of Chiral Chemicals	Switzerland
4	Sales Regions	Global
5	Competitors	Corden Pharma

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.10.2 Product Portfolio

Figure Bachem Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.10.3 Bachem Chiral Chemicals Business Performance

## 10.11 Beckman

### 10.11.1 Overview

Table Beckman Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.beckmancoulter.com/">https://www.beckmancoulter.com/</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Boulder Scientific

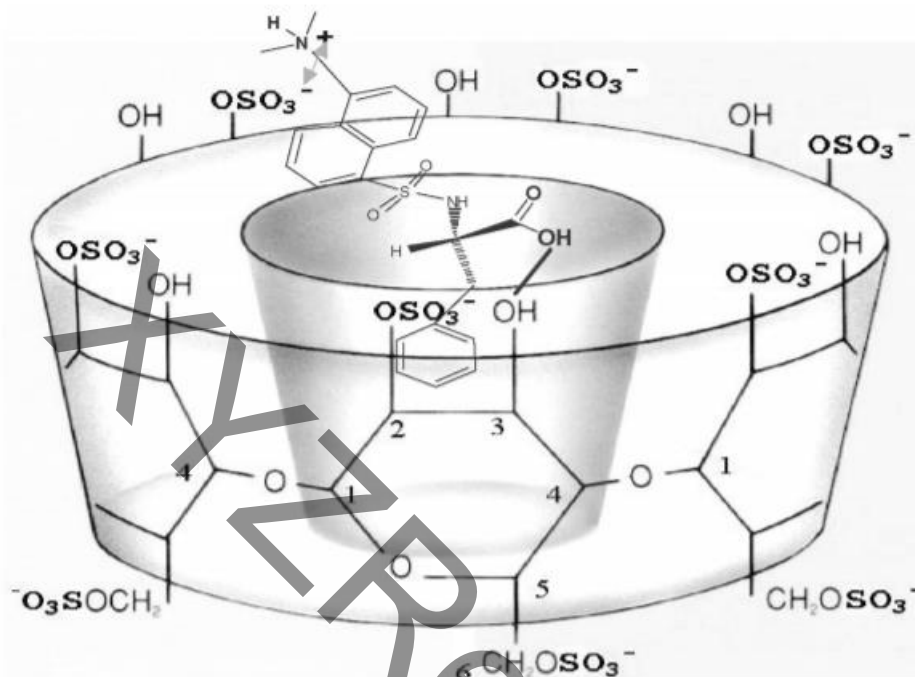
Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019





## 10.11.2 Product Portfolio

Figure Beckman Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.11.3 Beckman Chiral Chemicals Business Performance

## 10.12 Boulder Scientific

### 10.12.1 Overview

Table Boulder Scientific Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.bouldersci.com/">https://www.bouldersci.com/</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Cambrex Corporation

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.12.2 Product Portfolio

Figure Boulder Scientific Product Information




Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.12.3 Boulder Scientific Chiral Chemicals Business Performance

## 10.13 Cambrex Corporation

### 10.13.1 Overview

Table Cambrex Corporation Profiles

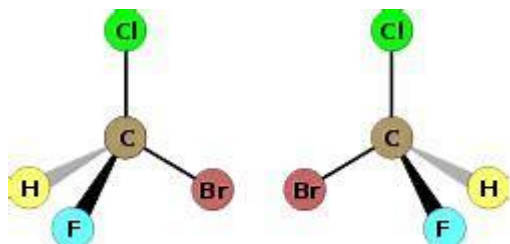
#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.cambrex.com/drug-substance/generic-apis/">https://www.cambrex.com/drug-substance/generic-apis/</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Chiral Technologies

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.13.2 Product Portfolio

Figure Cambrex Corporation Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.13.3 Cambrex Corporation Chiral Chemicals Business Performance

## 10.14 Chiral Technologies

### 10.14.1 Overview

Table Chiral Technologies Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://chiraltech.com/pharmaceutical-industry/">https://chiraltech.com/pharmaceutical-industry/</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Codexis

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.14.2 Product Portfolio

Figure Chiral Technologies Product Information




Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.14.3 Chiral Technologies Chiral Chemicals Business Performance

### 10.15 Codexis

#### 10.15.1 Overview

Table Codexis Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.codexis.com/">https://www.codexis.com/</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	JASCO

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.15.2 Product Portfolio

Figure Codexis Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.15.3 Codexis Chiral Chemicals Business Performance

## 10.16 Corden Pharma

### 10.16.1 Overview

Table Corden Pharma Profiles

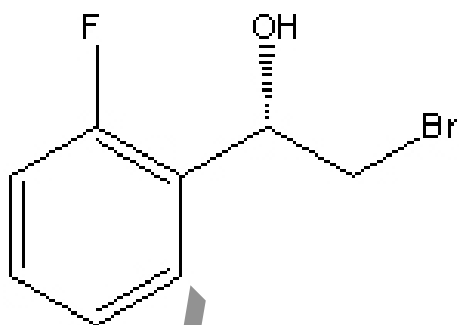
#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.cordenpharma.com/facilities/liestal/">https://www.cordenpharma.com/facilities/liestal/</a>
3	Manufacturing Locations of Chiral Chemicals	Switzerland
4	Sales Regions	Global
5	Competitors	Bachem

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.16.2 Product Portfolio

Figure Corden Pharma Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.16.3 Corden Pharma Chiral Chemicals Business Performance

## 10.17 Daicel Corporation

### 10.17.1 Overview

Table Daicel Corporation Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.daicel.com/en/">https://www.daicel.com/en/</a>
3	Manufacturing Locations of Chiral Chemicals	Japan
4	Sales Regions	Global
5	Competitors	Alps Pharmaceutical

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.17.2 Product Portfolio

Figure Daicel Corporation Product Information

**DAICEL**  
Organic Chemical  
Products Company




Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.17.3 Daicel Corporation Chiral Chemicals Business Performance

## 10.18 Digital Specialty Chemicals

### 10.18.1 Overview

Table Digital Specialty Chemicals Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.digitalspecialtychemicals.com/portfolio-types/chiral-ligands/">https://www.digitalspecialtychemicals.com/portfolio-types/chiral-ligands/</a>
3	Manufacturing Locations of Chiral Chemicals	Canada
4	Sales Regions	Global
5	Competitors	Groupe Novasep

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.18.2 Product Portfolio

Figure Digital Specialty Chemicals Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.18.3 Digital Specialty Chemicals Chiral Chemicals Business Performance

### 10.19 Groupe Novasep

#### 10.19.1 Overview

Table Groupe Novasep Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.novasep.com/">https://www.novasep.com/</a>
3	Manufacturing Locations of Chiral Chemicals	France
4	Sales Regions	Global
5	Competitors	Rhodia

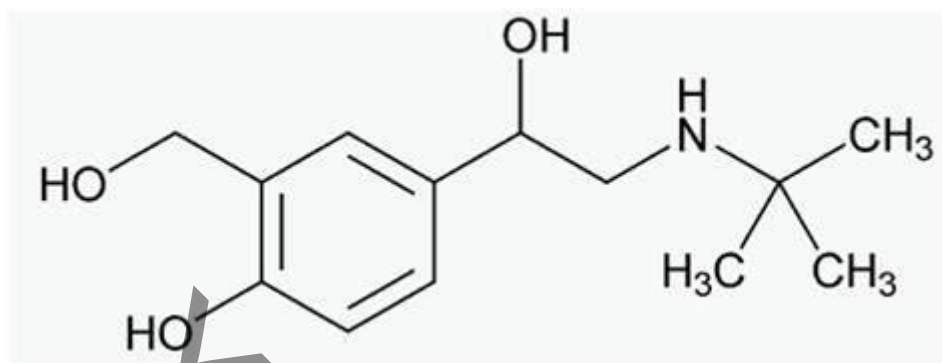
Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019





## 10.19.2 Product Portfolio

Figure Groupe Novasep Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.19.3 Groupe Novasep Chiral Chemicals Business Performance

### 10.20 JASCO

#### 10.20.1 Overview

Table JASCO Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="http://www.jasco.nl/chiral-detector/">http://www.jasco.nl/chiral-detector/</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	PerkinElmer

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.20.2 Product Portfolio

Figure JASCO Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.20.3 JASCO Chiral Chemicals Business Performance

## 10.21 PerkinElmer

### 10.21.1 Overview

Table PerkinElmer Profiles

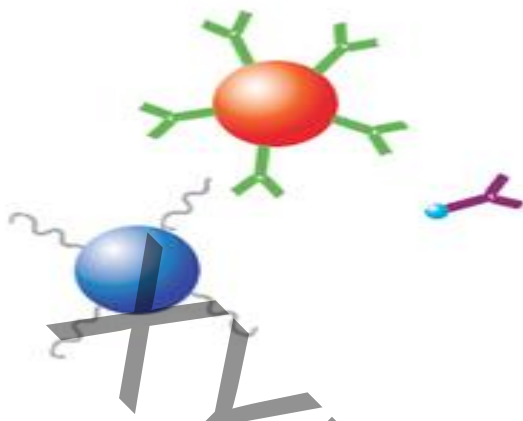
#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.perkinelmer.com.cn/product/14c-3h-and-35s-custom-synthesis-cusreag2">https://www.perkinelmer.com.cn/product/14c-3h-and-35s-custom-synthesis-cusreag2</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Regis Technologies

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.21.2 Product Portfolio

Figure PerkinElmer Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.21.3 PerkinElmer Chiral Chemicals Business Performance

## 10.22 Regis Technologies

### 10.22.1 Overview

Table Regis Technologies Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.registech.com/">https://www.registech.com/</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Strem Chemicals

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.22.2 Product Portfolio

Figure Regis Technologies Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.22.3 Regis Technologies Chiral Chemicals Business Performance

### 10.23 Rhodia

#### 10.23.1 Overview

Table Rhodia Profiles

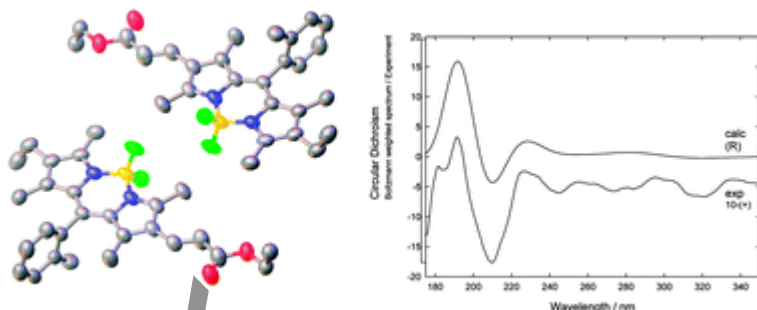
#	Item	Description
1	Company Logo	
2	Website	<a href="https://rhodiapads.com/">https://rhodiapads.com/</a>
3	Manufacturing Locations of Chiral Chemicals	France
4	Sales Regions	Global
5	Competitors	Groupe Novasep

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.23.2 Product Portfolio

Figure Rhodia Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.23.3 Rhodia Chiral Chemicals Business Performance

## 10.24 Shanghai Hanhong Chemical

### 10.24.1 Overview

Table Shanghai Hanhong Chemical Profiles

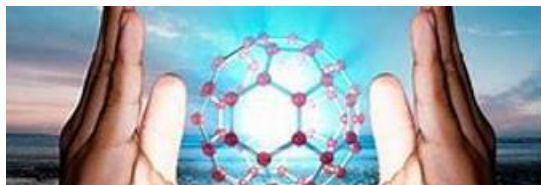
#	Item	Description
1	Company Logo	
2	Website	<a href="http://www.hanhonggroup.com/en/index.php?mod=products&amp;act=list&amp;cid=658&amp;k=F">http://www.hanhonggroup.com/en/index.php?mod=products&amp;act=list&amp;cid=658&amp;k=F</a>
3	Manufacturing Locations of Chiral Chemicals	China
4	Sales Regions	Global
5	Competitors	Suzhou ChonTech PharmaChem Technology

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.24.2 Product Portfolio

Figure Shanghai Hanhong Chemical Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.24.3 Shanghai Hanhong Chemical Chiral Chemicals Business Performance

### 10.25 SK Corporation

#### 10.25.1 Overview

Table SK Corporation Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.skchemicals.com/main.do">https://www.skchemicals.com/main.do</a>
3	Manufacturing Locations of Chiral Chemicals	South Korea
4	Sales Regions	Global
5	Competitors	Strem Chemicals

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.25.2 Product Portfolio

Figure SK Corporation Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.25.3 SK Corporation Chiral Chemicals Business Performance

## 10.26 Strem Chemicals

### 10.26.1 Overview

Table Strem Chemicals Profiles

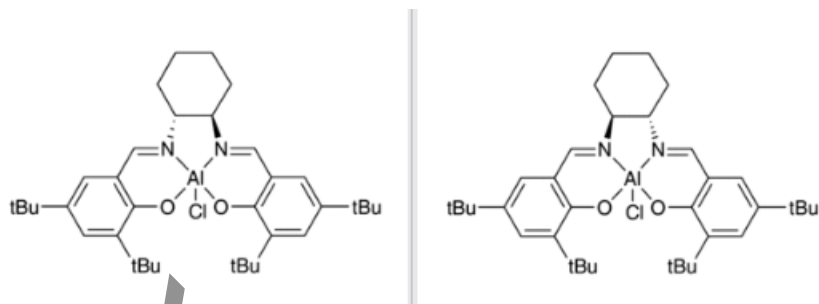
#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.strem.com/">https://www.strem.com/</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Waters Corporation

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 10.26.2 Product Portfolio

Figure Strem Chemicals Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.26.3 Strem Chemicals Chiral Chemicals Business Performance

## 10.27 Suzhou ChonTech PharmaChem Technology

### 10.27.1 Overview

Table Suzhou ChonTech PharmaChem Technology Profiles

#	Item	Description
1	Company Logo	 苏州强盛生物医药有限公司 Suzhou ChonTech BioPharma Co., Ltd.
2	Website	<a href="http://www.chontech.com/products.php">http://www.chontech.com/products.php</a>
3	Manufacturing Locations of Chiral Chemicals	China
4	Sales Regions	Global
5	Competitors	Shanghai Hanhong Chemical

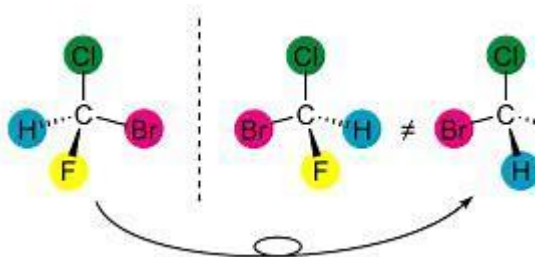
Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019





## 10.27.2 Product Portfolio

Figure Suzhou ChonTech PharmaChem Technology Product Information



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.27.3 Suzhou ChonTech PharmaChem Technology Chiral Chemicals Business Performance

## 10.28 Waters Corporation

### 10.28.1 Overview

Table Waters Corporation Profiles

#	Item	Description
1	Company Logo	
2	Website	<a href="https://www.waters.com/">https://www.waters.com/</a>
3	Manufacturing Locations of Chiral Chemicals	US
4	Sales Regions	Global
5	Competitors	Strem Chemicals

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.28.2 Product Portfolio

Figure Waters Corporation Product Information

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 10.28.3 Waters Corporation Chiral Chemicals Business Performance



# 11 World Chiral Chemicals Market Assessment by Players

## 11.1 World Chiral Chemicals Revenue by Players (2014-2019)

Table Revenue (Million USD) of Players (2014-2019)

	2014	2015	2016	2017	2018	2019
BASF	Xx	Xx	Xx	Xx	Xx	Xx
Dow	Xx	Xx	Xx	Xx	Xx	Xx
Solvias	Xx	Xx	Xx	Xx	Xx	Xx
Johnson	Xx	Xx	Xx	Xx	Xx	Xx
W. R. Grace	Xx	Xx	Xx	Xx	Xx	Xx
Thermo Fisher Scientific	Xx	Xx	Xx	Xx	Xx	Xx
Agilent	Xx	Xx	Xx	Xx	Xx	Xx
Albemarle	Xx	Xx	Xx	Xx	Xx	Xx
Alps Pharmaceutical	Xx	Xx	Xx	Xx	Xx	Xx
Bachem	Xx	Xx	Xx	Xx	Xx	Xx
Beckman	Xx	Xx	Xx	Xx	Xx	Xx
Boulder Scientific	Xx	Xx	Xx	Xx	Xx	Xx
Cambrex Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Chiral Technologies	Xx	Xx	Xx	Xx	Xx	Xx
Codexis	Xx	Xx	Xx	Xx	Xx	Xx
Corden Pharma	Xx	Xx	Xx	Xx	Xx	Xx
Daicel Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Digital Specialty Chemicals	Xx	Xx	Xx	Xx	Xx	Xx
Groupe Novasep	Xx	Xx	Xx	Xx	Xx	Xx
JASCO	Xx	Xx	Xx	Xx	Xx	Xx
PerkinElmer	Xx	Xx	Xx	Xx	Xx	Xx
Regis Technologies	Xx	Xx	Xx	Xx	Xx	Xx
Rhodia	Xx	Xx	Xx	Xx	Xx	Xx
Shanghai Hanhong Chemical	Xx	Xx	Xx	Xx	Xx	Xx
SK Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Strem Chemicals	Xx	Xx	Xx	Xx	Xx	Xx
Suzhou ChonTech PharmaChem Technology	Xx	Xx	Xx	Xx	Xx	Xx
Waters Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Global Other	Xx	Xx	Xx	Xx	Xx	Xx
Global Total	Xx	Xx	Xx	Xx	Xx	Xx

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



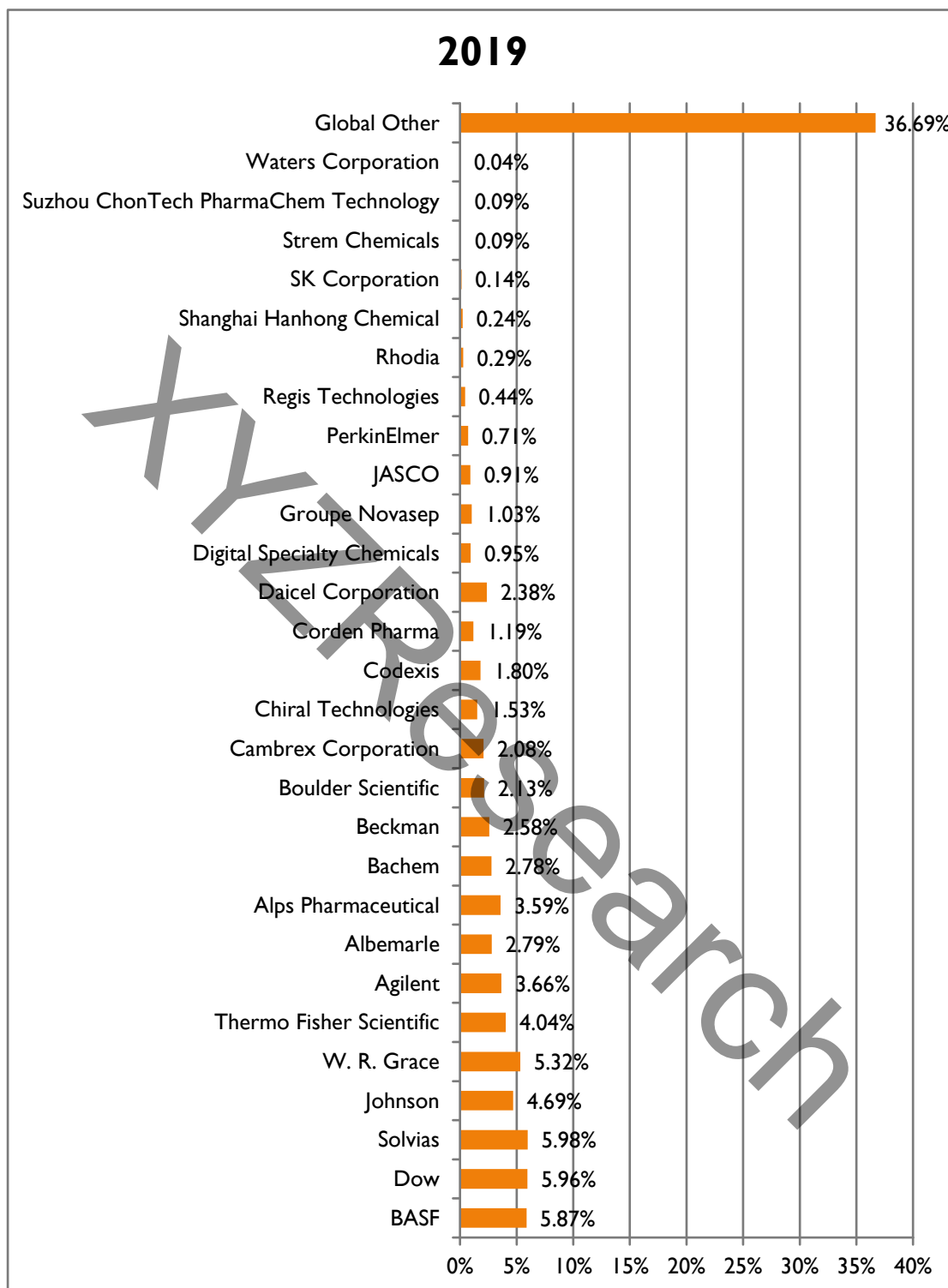
Table Revenue Share of Players (2014-2019)

	2014	2015	2016	2017	2018	2019
BASF	Xx	Xx	Xx	Xx	Xx	Xx
Dow	Xx	Xx	Xx	Xx	Xx	Xx
Solvias	Xx	Xx	Xx	Xx	Xx	Xx
Johnson	Xx	Xx	Xx	Xx	Xx	Xx
W. R. Grace	Xx	Xx	Xx	Xx	Xx	Xx
Thermo Fisher Scientific	Xx	Xx	Xx	Xx	Xx	Xx
Agilent	Xx	Xx	Xx	Xx	Xx	Xx
Albemarle	Xx	Xx	Xx	Xx	Xx	Xx
Alps Pharmaceutical	Xx	Xx	Xx	Xx	Xx	Xx
Bachem	Xx	Xx	Xx	Xx	Xx	Xx
Beckman	Xx	Xx	Xx	Xx	Xx	Xx
Boulder Scientific	Xx	Xx	Xx	Xx	Xx	Xx
Cambrex Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Chiral Technologies	Xx	Xx	Xx	Xx	Xx	Xx
Codexis	Xx	Xx	Xx	Xx	Xx	Xx
Corden Pharma	Xx	Xx	Xx	Xx	Xx	Xx
Daicel Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Digital Specialty Chemicals	Xx	Xx	Xx	Xx	Xx	Xx
Groupe Novasep	Xx	Xx	Xx	Xx	Xx	Xx
JASCO	Xx	Xx	Xx	Xx	Xx	Xx
PerkinElmer	Xx	Xx	Xx	Xx	Xx	Xx
Regis Technologies	Xx	Xx	Xx	Xx	Xx	Xx
Rhodia	Xx	Xx	Xx	Xx	Xx	Xx
Shanghai Hanhong Chemical	Xx	Xx	Xx	Xx	Xx	Xx
SK Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Strem Chemicals	Xx	Xx	Xx	Xx	Xx	Xx
Suzhou ChonTech PharmaChem Technology	Xx	Xx	Xx	Xx	Xx	Xx
Waters Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Global Other	Xx	Xx	Xx	Xx	Xx	Xx
Global Total	Xx	Xx	Xx	Xx	Xx	Xx

Source: Secondary Sources and XYZ-Research Chemical &amp; Material Research Center, 2019



Figure World Revenue Share in 2019

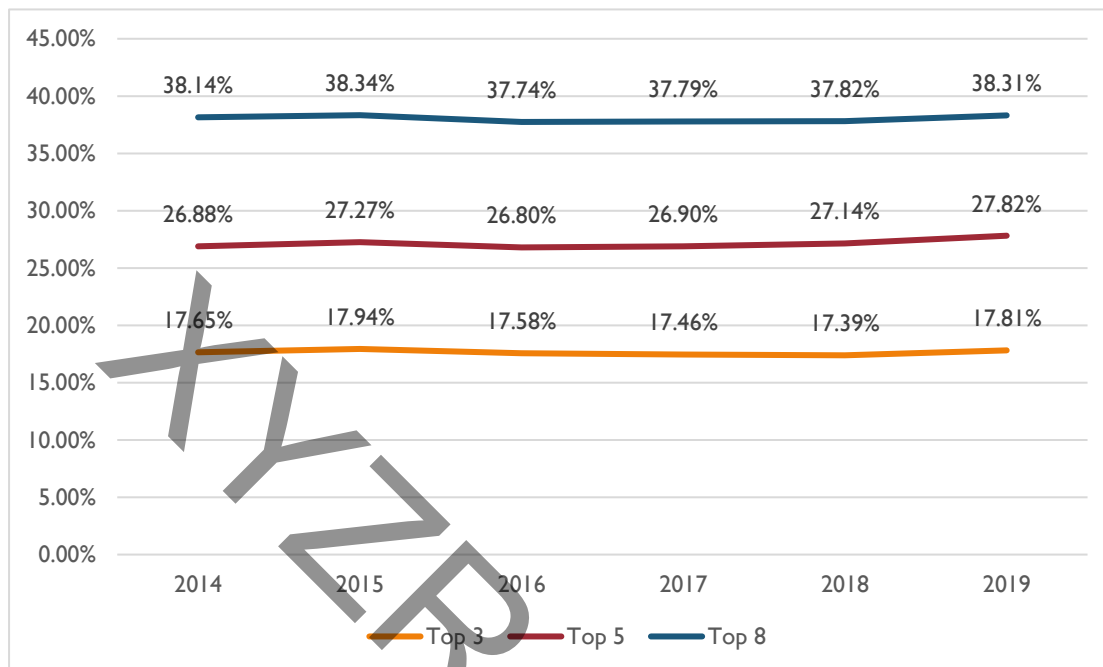


Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 11.2 Market Concentration

Figure World Market Concentration (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Table Top 5 Players Sales Share (2014-2019)

	2014	2015	2016	2017	2018	2019
<b>BASF</b>	Xx	Xx	Xx	Xx	Xx	Xx
<b>Dow</b>	Xx	Xx	Xx	Xx	Xx	Xx
<b>Solvias</b>	Xx	Xx	Xx	Xx	Xx	Xx
<b>Johnson</b>	Xx	Xx	Xx	Xx	Xx	Xx
<b>W. R. Grace</b>	Xx	Xx	Xx	Xx	Xx	Xx

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 12 Regional Market Performance by Segment of Players

### 12.1 Asia Pacific

Table Asia Pacific Chiral Chemicals Revenue (Million USD) of Players (2014-2019)

	2014	2015	2016	2017	2018	2019
BASF	Xx	Xx	Xx	Xx	Xx	Xx
Dow	Xx	Xx	Xx	Xx	Xx	Xx
Solvias	Xx	Xx	Xx	Xx	Xx	Xx
Johnson	Xx	Xx	Xx	Xx	Xx	Xx
W. R. Grace	Xx	Xx	Xx	Xx	Xx	Xx
Thermo Fisher Scientific	Xx	Xx	Xx	Xx	Xx	Xx
Agilent	Xx	Xx	Xx	Xx	Xx	Xx
Albemarle	Xx	Xx	Xx	Xx	Xx	Xx
Alps Pharmaceutical	Xx	Xx	Xx	Xx	Xx	Xx
Beckman	Xx	Xx	Xx	Xx	Xx	Xx
Boulder Scientific	Xx	Xx	Xx	Xx	Xx	Xx
Cambrex Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Chiral Technologies	Xx	Xx	Xx	Xx	Xx	Xx
Corden Pharma	Xx	Xx	Xx	Xx	Xx	Xx
Daicel Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Digital Specialty Chemicals	Xx	Xx	Xx	Xx	Xx	Xx
Groupe Novasep	Xx	Xx	Xx	Xx	Xx	Xx
JASCO	Xx	Xx	Xx	Xx	Xx	Xx
Shanghai Hanhong Chemical	Xx	Xx	Xx	Xx	Xx	Xx
SK Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Suzhou ChonTech	Xx	Xx	Xx	Xx	Xx	Xx
Asia Pacific Other	Xx	Xx	Xx	Xx	Xx	Xx
Asia Pacific Total	Xx	Xx	Xx	Xx	Xx	Xx

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



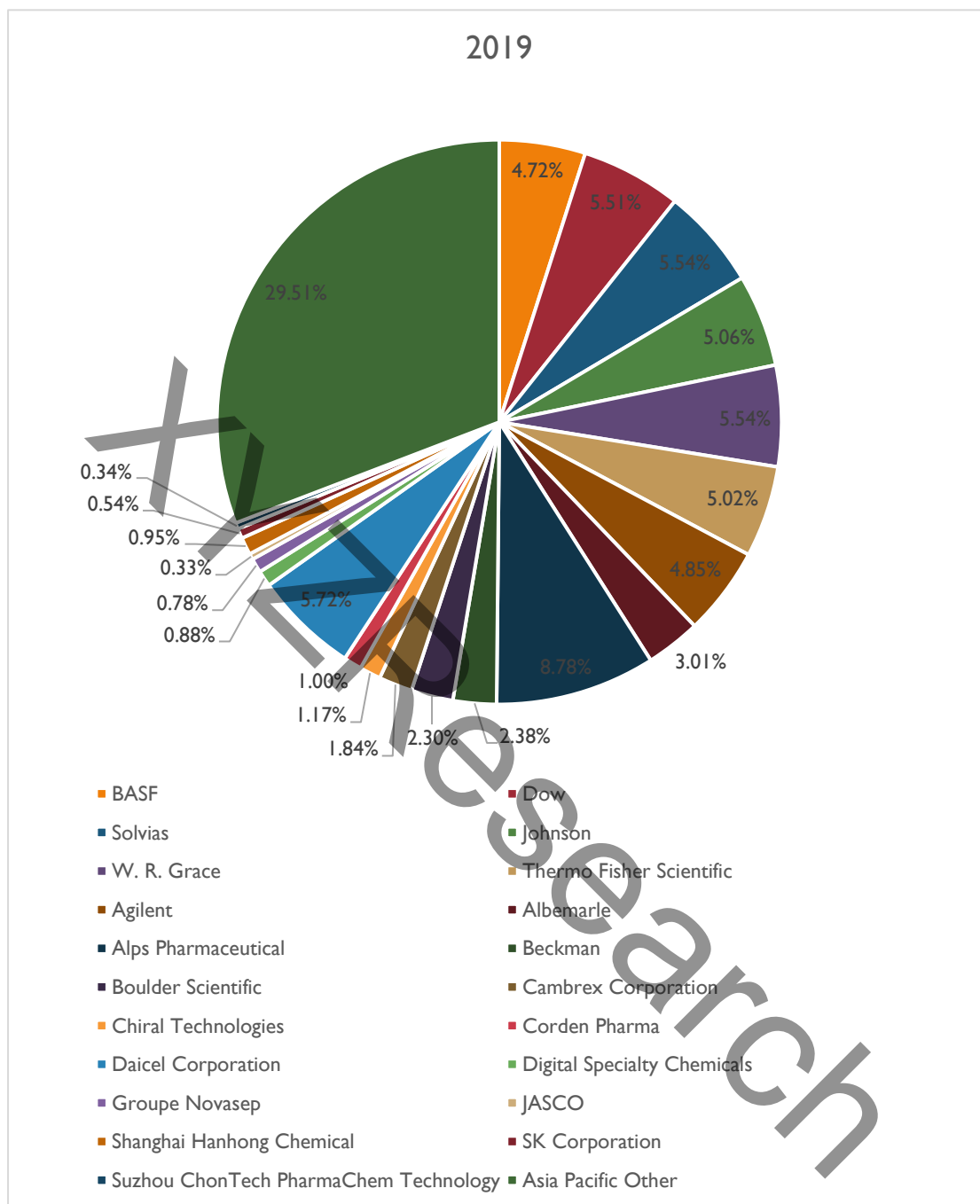
Table Asia Pacific Chiral Chemicals Revenue Share of Players (2014-2019)

	2014	2015	2016	2017	2018	2019
BASF	Xx	Xx	Xx	Xx	Xx	Xx
Dow	Xx	Xx	Xx	Xx	Xx	Xx
Solvias	Xx	Xx	Xx	Xx	Xx	Xx
Johnson	Xx	Xx	Xx	Xx	Xx	Xx
W. R. Grace	Xx	Xx	Xx	Xx	Xx	Xx
Thermo Fisher Scientific	Xx	Xx	Xx	Xx	Xx	Xx
Agilent	Xx	Xx	Xx	Xx	Xx	Xx
Albemarle	Xx	Xx	Xx	Xx	Xx	Xx
Alps Pharmaceutical	Xx	Xx	Xx	Xx	Xx	Xx
Beckman	Xx	Xx	Xx	Xx	Xx	Xx
Boulder Scientific	Xx	Xx	Xx	Xx	Xx	Xx
Cambrex Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Chiral Technologies	Xx	Xx	Xx	Xx	Xx	Xx
Corden Pharma	Xx	Xx	Xx	Xx	Xx	Xx
Daicel Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Digital Specialty Chemicals	Xx	Xx	Xx	Xx	Xx	Xx
Groupe Novasep	Xx	Xx	Xx	Xx	Xx	Xx
JASCO	Xx	Xx	Xx	Xx	Xx	Xx
Shanghai Hanhong Chemical	Xx	Xx	Xx	Xx	Xx	Xx
SK Corporation	Xx	Xx	Xx	Xx	Xx	Xx
Suzhou ChonTech	Xx	Xx	Xx	Xx	Xx	Xx
Asia Pacific Other	Xx	Xx	Xx	Xx	Xx	Xx
Asia Pacific Total	Xx	Xx	Xx	Xx	Xx	Xx

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



Figure Asia Pacific Chiral Chemicals Revenue Share in 2019



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019





12.2 North America

12.3 Europe

12.4 South America

12.5 Middle East and Africa

XYZResearch



# 13 Regional Market Performance by Segment of Countries

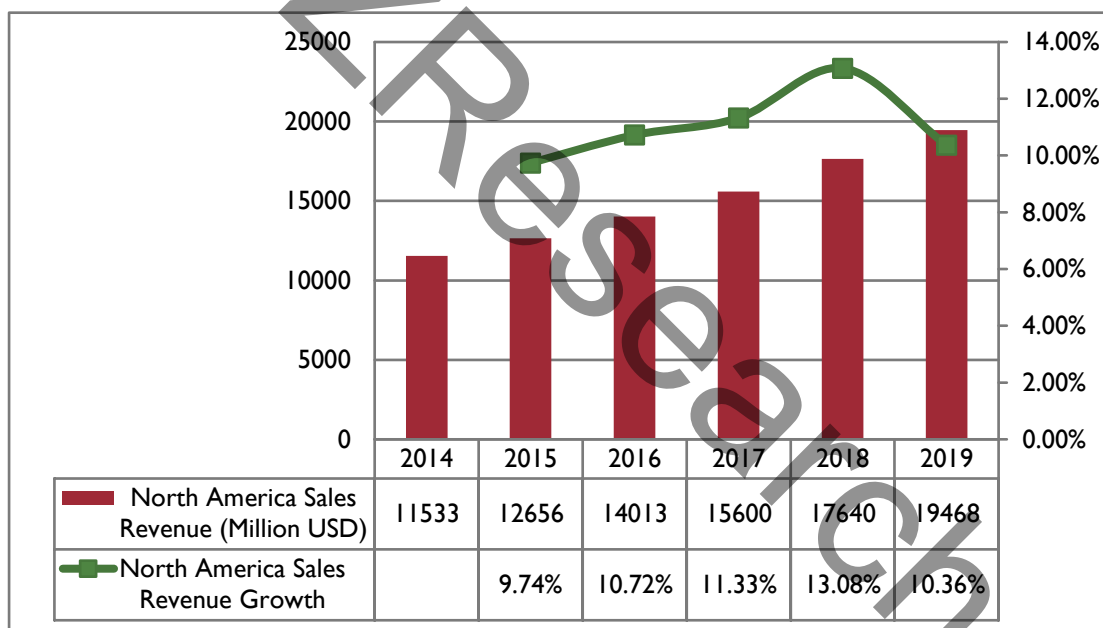
## 13.1 North America

Table North America Chiral Chemicals Revenue (Million USD) by Countries (2014-2019)

	2014	2015	2016	2017	2018	2019
USA	9076	9960	11049	12291	13862	15296
Canada	1770	1933	2161	2399	2680	3006
Mexico	687	763	803	910	1098	1166
North America	11533	12656	14013	15600	17640	19468

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure North America Revenue (Million USD) and Growth Rate (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

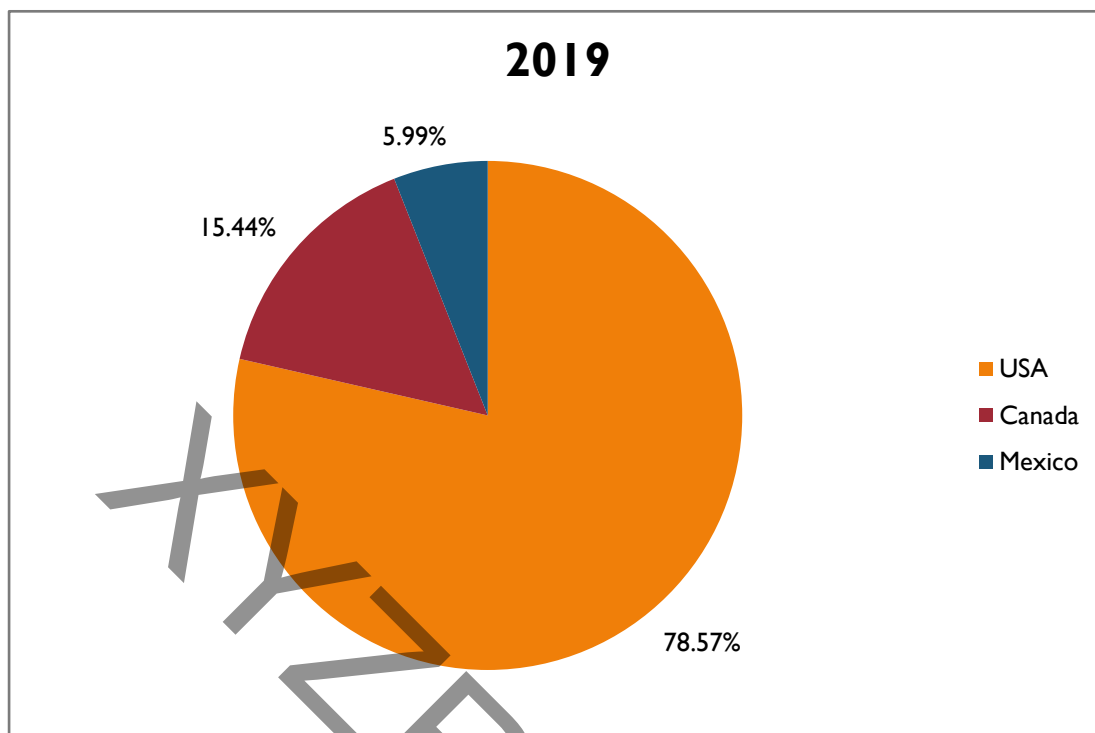
Table North America Chiral Chemicals Revenue Share by Regions (2014-2019)

	2014	2015	2016	2017	2018	2019
USA	78.70%	78.70%	78.85%	78.79%	78.58%	78.57%
Canada	15.35%	15.27%	15.42%	15.38%	15.19%	15.44%
Mexico	5.95%	6.03%	5.73%	5.83%	6.23%	5.99%
North America	100%	100%	100%	100%	100%	100%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



Figure North America Chiral Chemicals Revenue Share by Regions in 2019



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 13.2 Europe

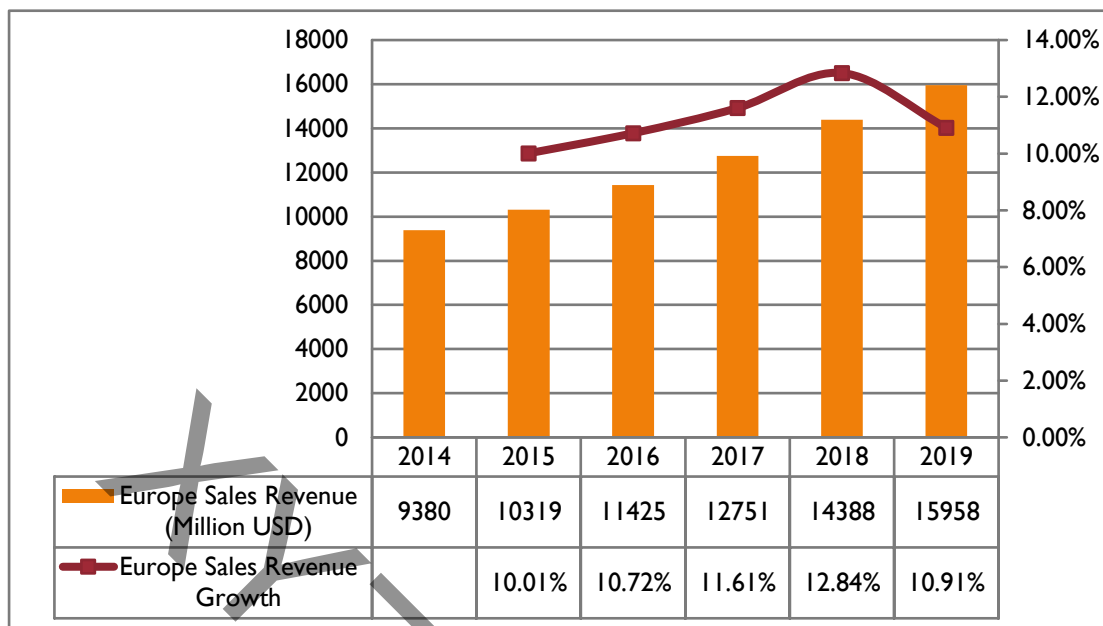
Table Europe Chiral Chemicals Revenue (Million USD) by Countries (2014-2019)

	2014	2015	2016	2017	2018	2019
Germany	2294	2510	2805	3115	3515	3879
UK	1721	1886	2070	2342	2646	2914
France	1227	1380	1492	1707	1914	2092
Russia	765	876	953	1062	1224	1364
Italy	649	714	836	900	1019	1154
Europe Other	2724	2953	3269	3625	4070	4555
Europe	9380	10319	11425	12751	14388	15958

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



Figure Europe Revenue (Million USD) and Growth Rate (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

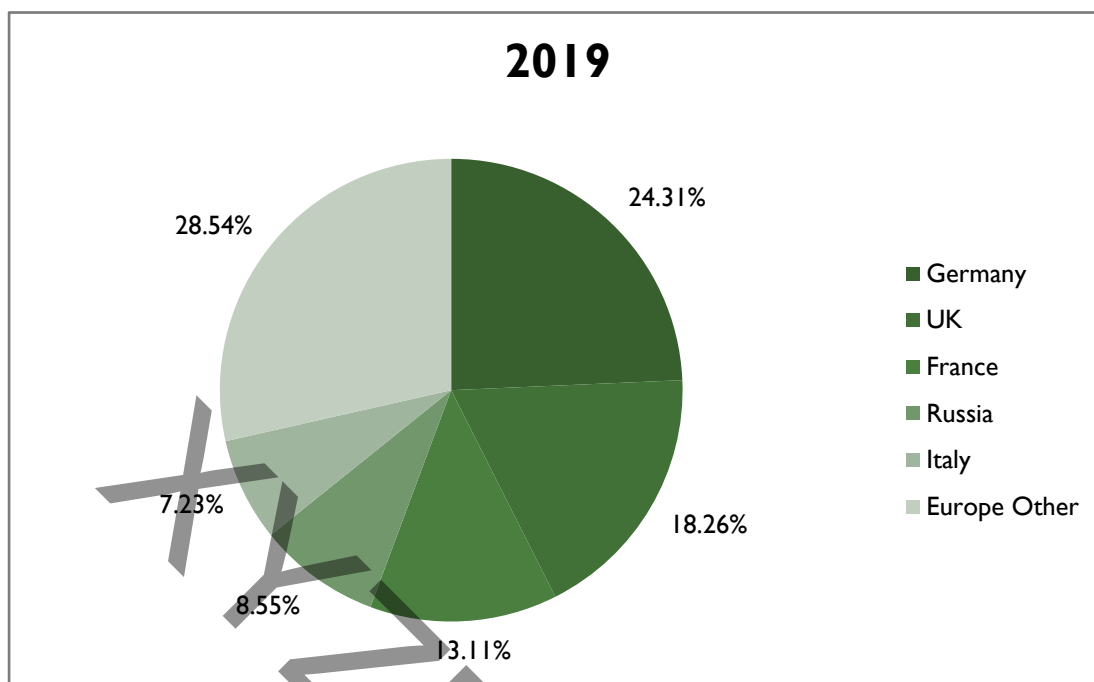
Table Europe Chiral Chemicals Revenue Share by Regions (2014-2019)

	2014	2015	2016	2017	2018	2019
Germany	24.46%	24.32%	24.55%	24.43%	24.43%	24.31%
UK	18.35%	18.28%	18.12%	18.37%	18.39%	18.26%
France	13.08%	13.37%	13.06%	13.39%	13.30%	13.11%
Russia	8.16%	8.49%	8.34%	8.33%	8.51%	8.55%
Italy	6.92%	6.92%	7.32%	7.06%	7.08%	7.23%
Europe Other	29.03%	28.62%	28.61%	28.42%	28.29%	28.54%
Europe	100%	100%	100%	100%	100%	100%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



Figure Europe Chiral Chemicals Revenue Share by Regions in 2019



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 13.3 Asia Pacific

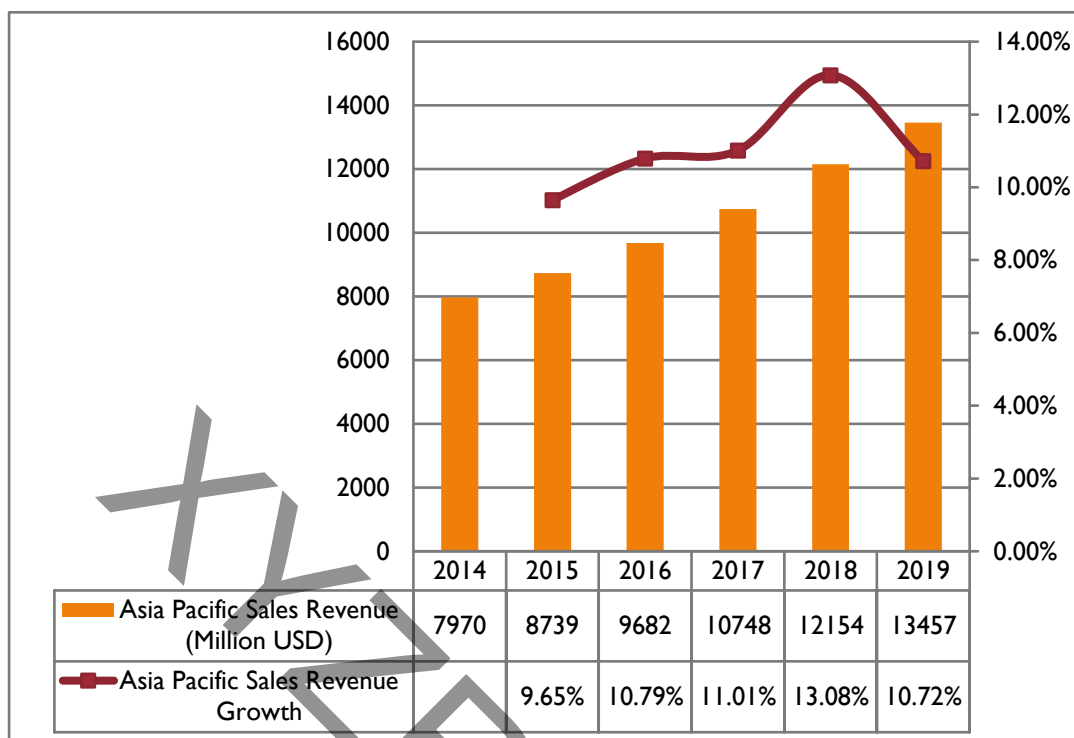
Table Asia Pacific Chiral Chemicals Revenue (Million USD) by Countries (2014-2019)

	2014	2015	2016	2017	2018	2019
China	3470	3827	4213	4701	5334	5867
Japan	2081	2263	2503	2786	3172	3497
Korea	413	452	518	581	658	700
India	991	1063	1176	1325	1485	1640
Southeast Asia	402	424	483	517	600	654
Asia Pacific Other	613	710	789	838	905	1099
<b>Asia Pacific</b>	<b>7970</b>	<b>8739</b>	<b>9682</b>	<b>10748</b>	<b>12154</b>	<b>13457</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



Figure Asia-Pacific Revenue (Million USD) and Growth Rate (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

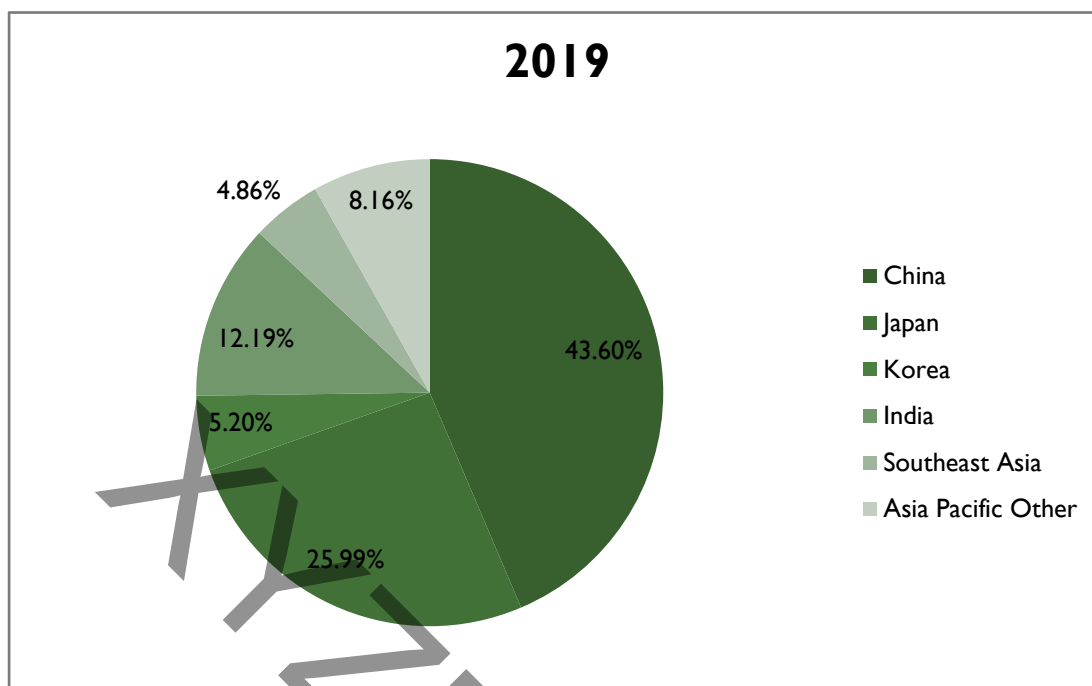
Table Asia Pacific Chiral Chemicals Revenue Share by Regions (2014-2019)

	2014	2015	2016	2017	2018	2019
China	43.54%	43.79%	43.51%	43.74%	43.89%	43.60%
Japan	26.11%	25.89%	25.85%	25.92%	26.10%	25.99%
Korea	5.18%	5.17%	5.35%	5.41%	5.41%	5.20%
India	12.44%	12.16%	12.15%	12.33%	12.22%	12.19%
Southeast Asia	5.04%	4.85%	4.99%	4.81%	4.94%	4.86%
Asia Pacific Other	7.69%	8.14%	8.15%	7.79%	7.44%	8.16%
Asia Pacific	100%	100%	100%	100%	100%	100%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



Figure Asia Pacific Chiral Chemicals Revenue Share by Regions in 2019



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 13.4 South America

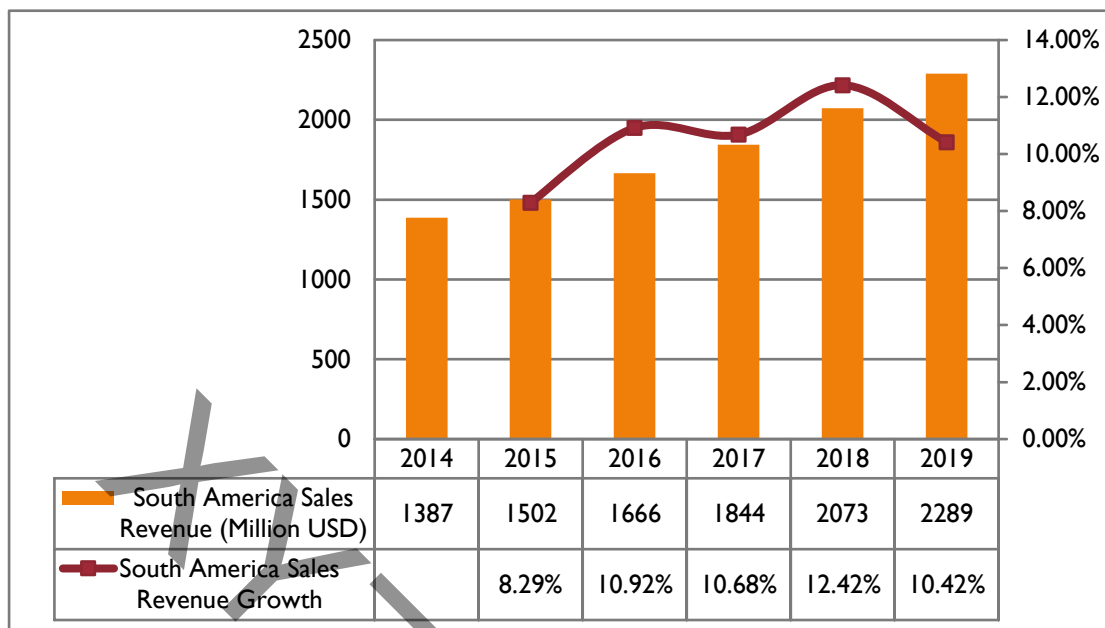
Table South America Chiral Chemicals Revenue (Million USD) by Countries (2014-2019)

	2014	2015	2016	2017	2018	2019
Brazil	550	598	661	735	818	906
Argentina	240	261	291	317	355	393
Colombia	184	197	224	242	278	300
Others	413	446	490	550	622	690
<b>Total</b>	<b>1387</b>	<b>1502</b>	<b>1666</b>	<b>1844</b>	<b>2073</b>	<b>2289</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



Figure South America Revenue (Million USD) and Growth Rate (2014-2019)



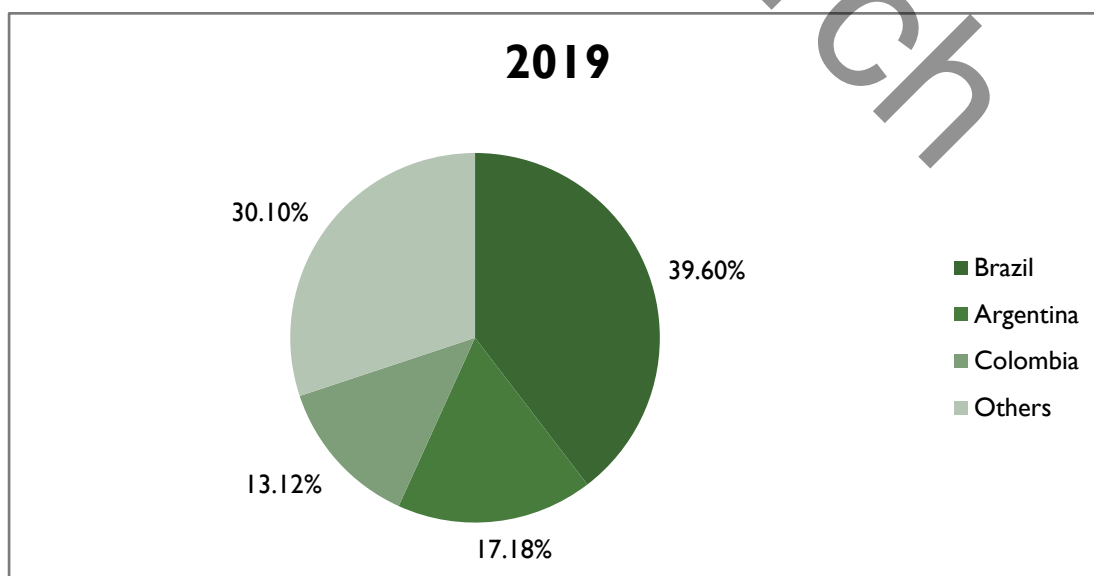
Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Table South America Chiral Chemicals Revenue Share by Regions (2014-2019)

	2014	2015	2016	2017	2018	2019
Brazil	39.68%	39.81%	39.66%	39.85%	39.47%	39.60%
Argentina	17.32%	17.35%	17.45%	17.20%	17.13%	17.18%
Colombia	13.29%	13.09%	13.43%	13.13%	13.40%	13.12%
Others	29.71%	29.75%	29.46%	29.82%	30.00%	30.10%
Total	100%	100%	100%	100%	100%	100%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure South America Chiral Chemicals Revenue Share by Regions in 2019



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019





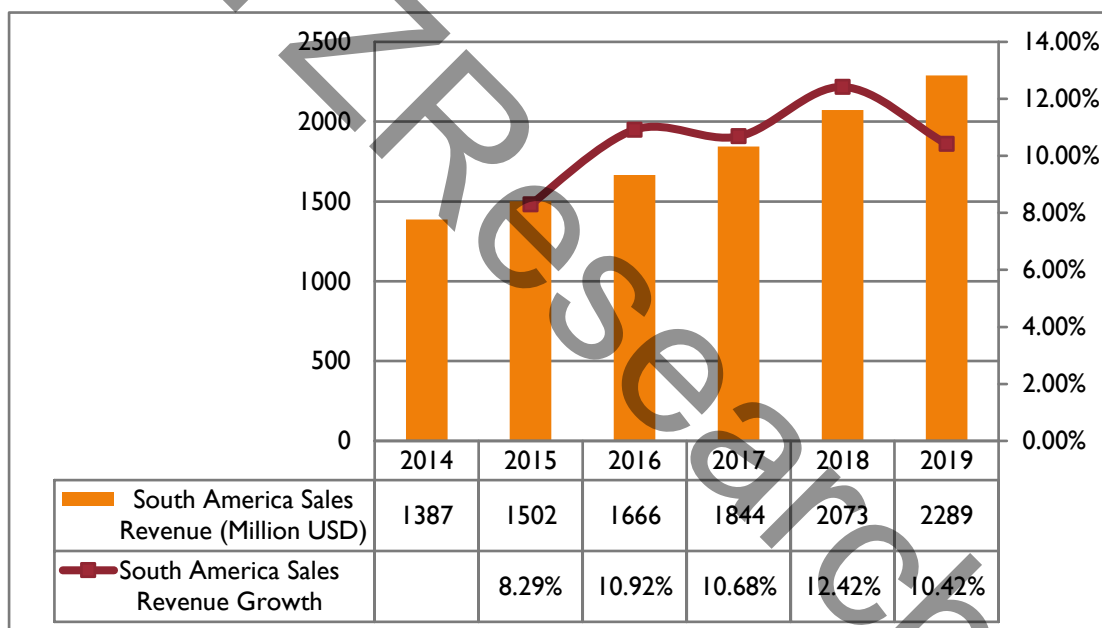
## 13.5 Middle East and Africa

Table Middle East and Africa Chiral Chemicals Revenue (Million USD) by Countries (2014-2019)

	2014	2015	2016	2017	2018	2019
Saudi Arabia	351	391	427	472	523	580
UAE	182	210	226	245	271	311
Egypt	158	176	193	209	229	263
Nigeria	128	140	155	173	188	215
South Africa	208	226	256	277	306	345
Others	616	687	752	833	921	1020
<b>Total</b>	<b>1643</b>	<b>1830</b>	<b>2009</b>	<b>2209</b>	<b>2438</b>	<b>2734</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure Middle East and Africa Revenue (Million USD) and Growth Rate (2014-2019)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

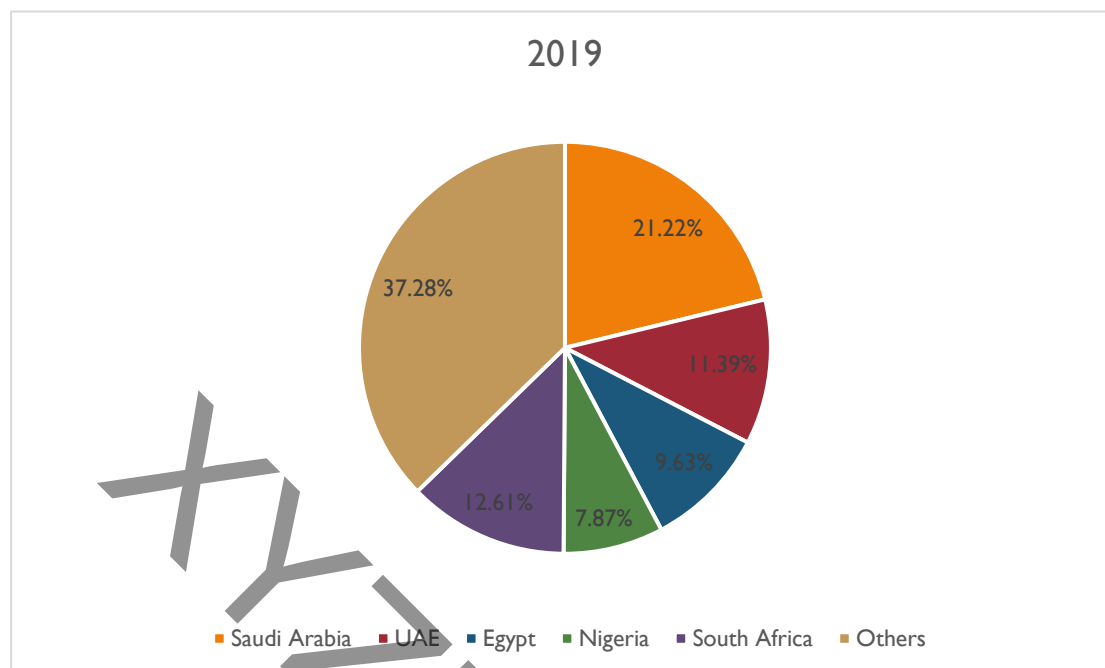
Table Middle East and Africa Chiral Chemicals Revenue Share by Regions (2014-2019)

	2014	2015	2016	2017	2018	2019
Saudi Arabia	21.34%	21.39%	21.25%	21.36%	21.47%	21.22%
UAE	11.10%	11.46%	11.23%	11.09%	11.11%	11.39%
Egypt	9.64%	9.63%	9.59%	9.44%	9.40%	9.63%
Nigeria	7.77%	7.64%	7.74%	7.81%	7.70%	7.87%
South Africa	12.66%	12.35%	12.73%	12.55%	12.56%	12.61%
Others	37.49%	37.53%	37.46%	37.75%	37.76%	37.28%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



Figure Middle East and Africa Chiral Chemicals Revenue Share by Regions in 2019



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



# 14 World Chiral Chemicals Sales & Revenue Forecast (2020-2025)

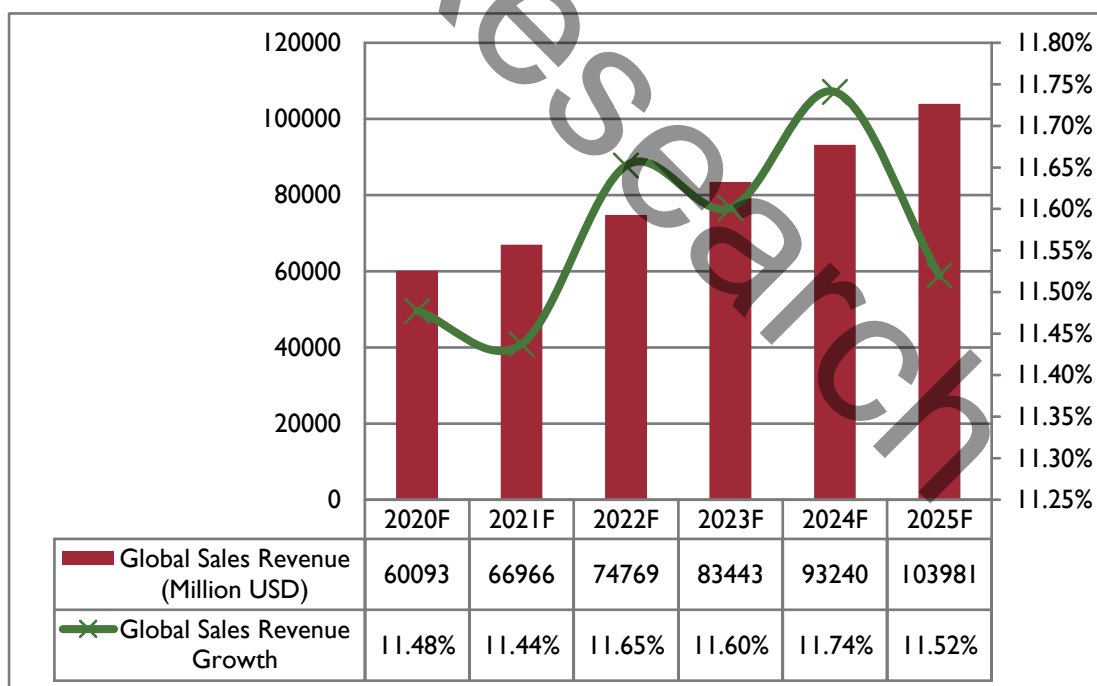
## 14.1 World Chiral Chemicals Sales and Revenue Forecast by Regions (2020-2025)

Table World Revenue (Million USD) by Regions (2020-2025)

	2020F	2021F	2022F	2023F	2024F	2025F
North America	21628	24074	26823	29793	33233	36977
Europe	17823	19846	22250	24974	27955	31265
Asia Pacific	15052	16841	18807	20985	23515	26269
South America	2540	2827	3126	3486	3866	4287
Middle East and Africa	3050	3378	3763	4205	4671	5183
Global Total	60093	66966	74769	83443	93240	103981

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure World Revenue (Million USD) and Growth Rate by Regions (2020-2025)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

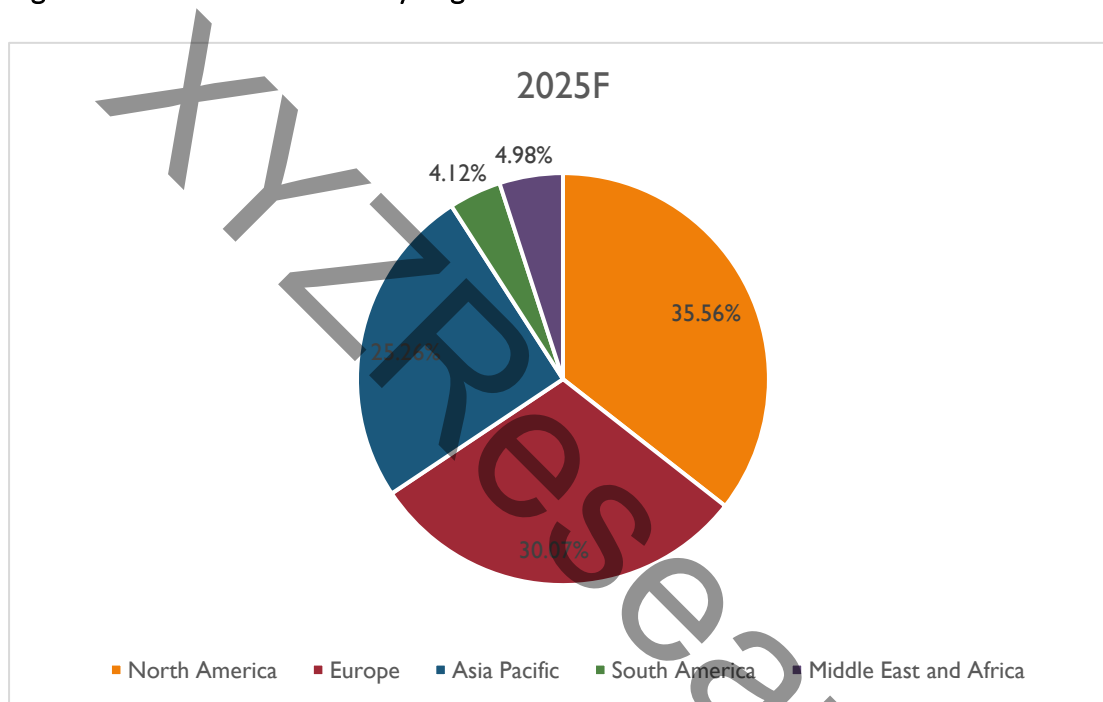


Table World Revenue Share (%) by Regions (2020-2025)

	2020F	2021F	2022F	2023F	2024F	2025F
North America	35.99%	35.95%	35.87%	35.70%	35.64%	35.56%
Europe	29.66%	29.64%	29.76%	29.93%	29.98%	30.07%
Asia Pacific	25.05%	25.15%	25.15%	25.15%	25.22%	25.26%
South America	4.23%	4.22%	4.18%	4.18%	4.15%	4.12%
Middle East and Africa	5.08%	5.04%	5.03%	5.04%	5.01%	4.98%
Global Total	100%	100%	100%	100%	100%	100%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure World Revenue Share by Regions in 2025



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



# 15 Asia Pacific Chiral Chemicals Market Forecast

## 15.1 Revenue (Million USD) Forecast by Type, 2020-2025

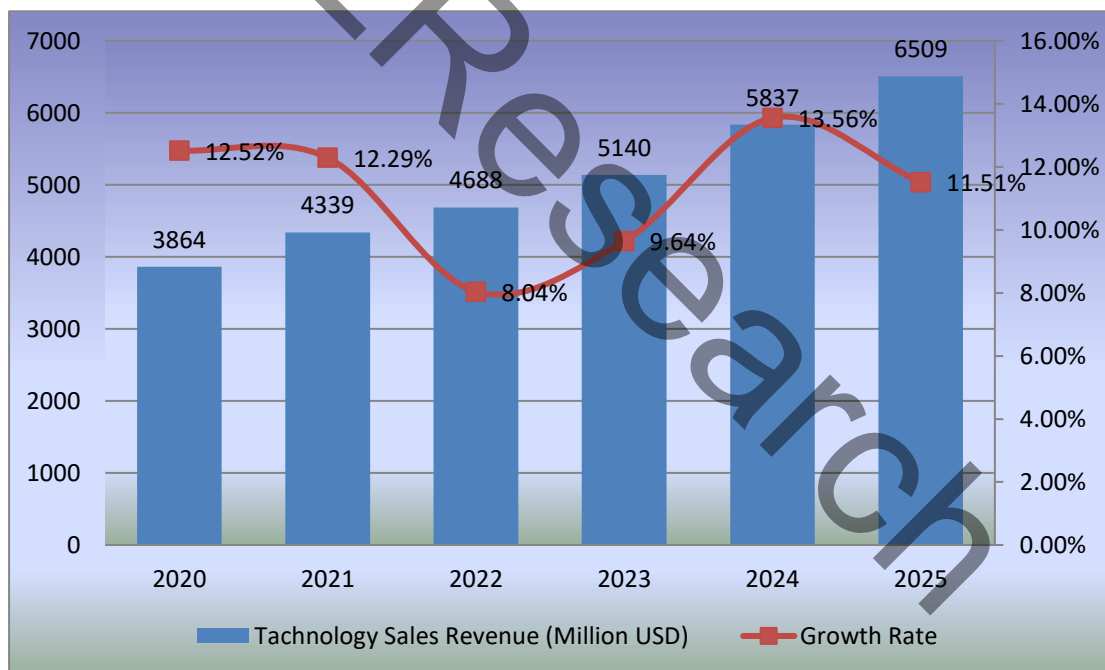
### 15.1.1 Technology

Table Sales (Unit) & Revenue (Million USD), 2020-2025

	2020	2021	2022	2023	2024	2025
Sales	3864	4339	4688	5140	5837	6509
Revenue	12.52%	12.29%	8.04%	9.64%	13.56%	11.51%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure Revenue (Million USD) and Growth Rate (2020-2025)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 15.1.2 Traditional Separation Method

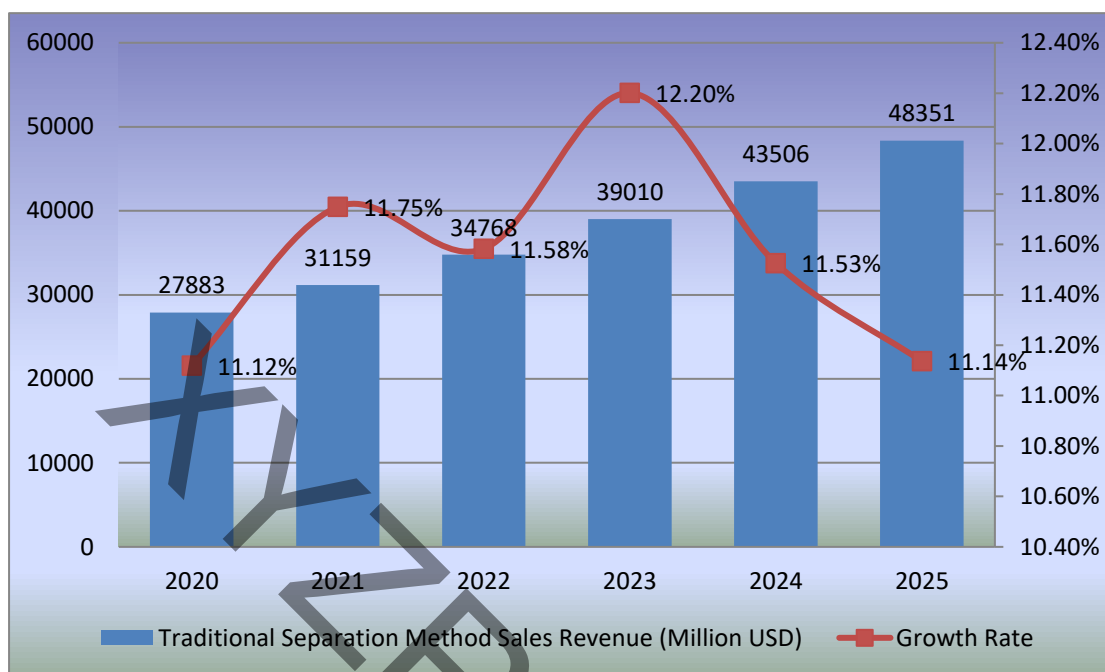
Table Sales (Unit) & Revenue (Million USD), 2020-2025

	2020	2021	2022	2023	2024	2025
Sales	27883	31159	34768	39010	43506	48351
Revenue	11.12%	11.75%	11.58%	12.20%	11.53%	11.14%



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

Figure Revenue (Million USD) and Growth Rate (2020-2025)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 15.1.3 Asymmetric Preparation Method

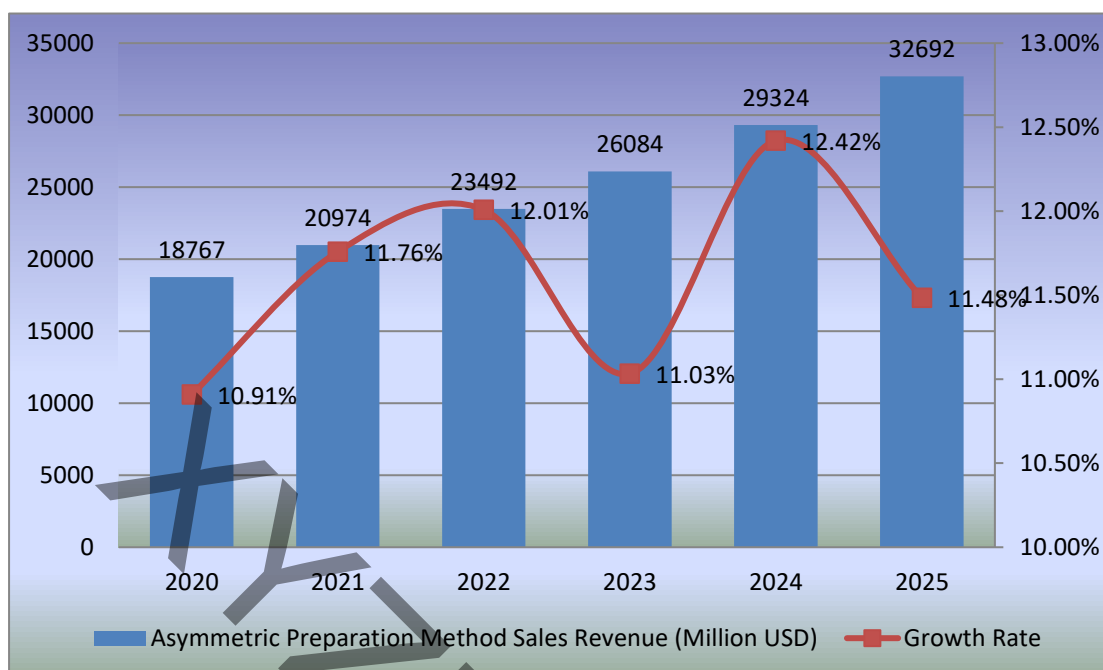
Table Sales (Unit) & Revenue (Million USD), 2020-2025

	2020	2021	2022	2023	2024	2025
Sales	18767	20974	23492	26084	29324	32692
Revenue	10.91%	11.76%	12.01%	11.03%	12.42%	11.48%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



Figure Revenue (Million USD) and Growth Rate (2020-2025)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

### 15.1.4 Biological Separation Method

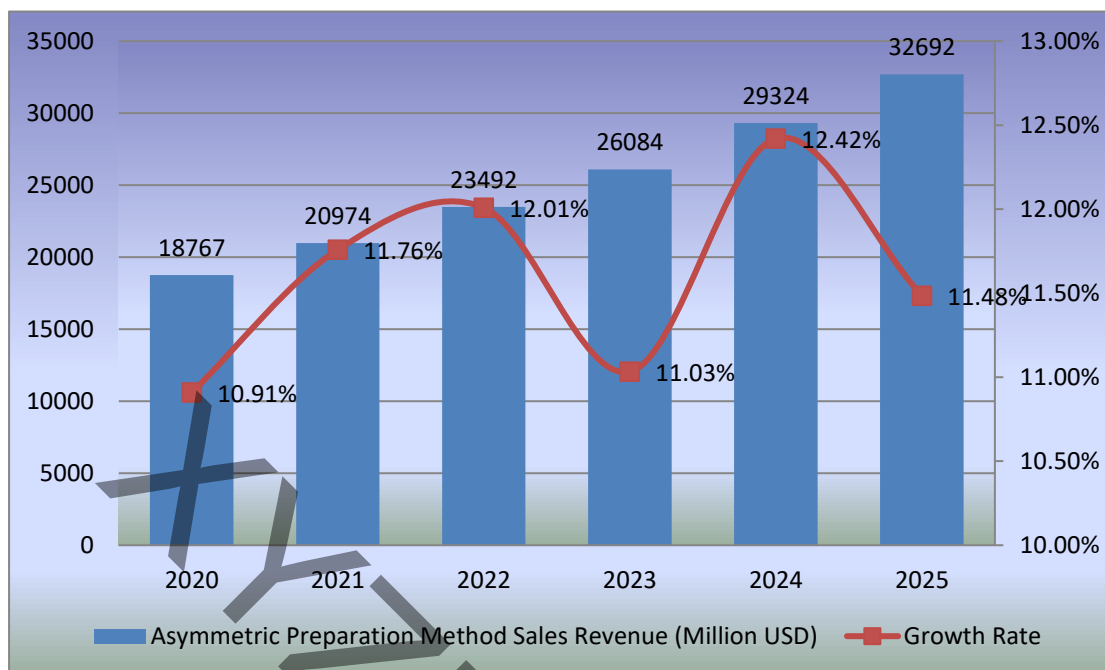
Table Sales (Unit) & Revenue (Million USD), 2020-2025

	2020	2021	2022	2023	2024	2025
Sales	8407	9160.9	10430.3	11498.4	13072.2	14255.8
Revenue	11.72%	8.97%	13.86%	10.24%	13.69%	9.05%

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



Figure Revenue (Million USD) and Growth Rate (2020-2025)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019

## 15.2 Consumption Forecast by Application, 2020-2025

Table Consumption (Million USD) Forecast by Application (2020-2025)

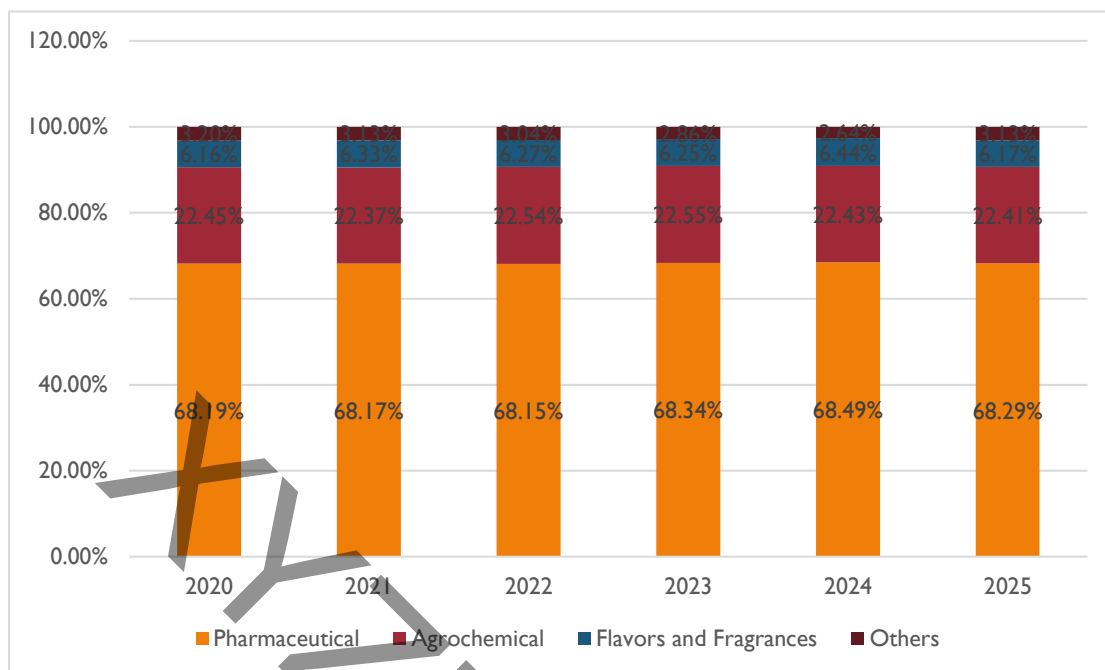
	2020	2021	2022	2023	2024	2025
Pharmaceutical	40977	45651	50955	57025	63860	71009
Agrochemical	13491	14980	16853	18816	20914	23302
Flavors and Fragrances	3702	4239	4688	5215	6005	6416
Others	1923	2096	2273	2387	2461	3254
<b>Total</b>	<b>60093</b>	<b>66966</b>	<b>74769</b>	<b>83443</b>	<b>93240</b>	<b>103981</b>

Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019





Figure Consumption Forecast by Application (2020-2025)



Source: Secondary Sources and XYZ-Research Chemical & Material Research Center, 2019



## 16 Conclusion

The chiral chemicals market size will grow to USD 104 billion during 2018-2025, Increasing demand for chiral chemicals from the pharmaceutical sector will positively impact the chiral chemicals market during the forecast period. Chiral chemicals are used in the pharmaceutical industry as antihistamines, antibiotics, antidiabetics, antivirals, anorexics, and cancer therapies. They are also widely used in chemical diagnostics and research applications.

The rapid growth of the medical and pharmaceutical industry due to the increasing geriatric population will power the global chiral chemicals market. Additionally, increments in investments and increasing R&D activities to identify new drug formulations from chiral chemicals will lead to profitable and long term growth. Moreover, the superior chemical properties of chiral chemicals, such as varying hardness characteristics due to their geometrical and superimposable properties coupled with the rise in demand for pure enantiomeric drug formulations in the medical and pharmaceutical industry are expected to propel the market to register a CAGR of close to 11.57% during the forecast period.

The high demand for chiral chemicals from the flavors and fragrance industry is one of the key trends expected to gain traction in the market. Chemicals including menthol, carvone, ambergris are some of the common chemicals used in the flavors and fragrance industry. These chemicals are expected to witness considerable growth mainly due to the increasing annual production of methanol from economies including Brazil, India, and China. Also, the high growth rate of the personal care and cosmetic industry is further expected to boost the demand for chiral chemicals in the forthcoming years.

This is the end of Chiral Chemicals report.

Thanks for reading, for any question, please feel free to contact the XYZ-Research Center analyst Mr. Fang Tel: +86-18500033782 Email: sales@xyz-research.com