

# Survey of Fluorine Industry in China

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## Introduction

Fluorine chemical products with the characteristics of chemical resistance, good resistance in high and low temperatures, aging resistance, low friction, excellent insulation, etc., are widely applied in many fields. In recent years, fluorine chemical industry has been one of the fastest developing and most promising chemical industries in China.

China's fluorine chemical can be dated back to the 1950s. With abundant fluorite reserves, the industry has grown into a large scale one after more than 60-year development.

From 2016 to date, under growing environmental protection pressure, the market witnessed a shortage of fluorite, which led to sharp rise in the price of fluorine products. Besides, demand from downstream sectors and international environment also had their shares in the price hike.

During 2016–2019, the ex-works price of fluorite in China reached the highest record in April 2018 and then remained high.

With the shortage of fluorite in China, all the downstream products have experienced rocketing prices since 2017, and reached the highest (in the past six years) in or around April 2018. In 2019, the prices fell in general, but still at high level.

This report presents an overview of fluorine products' production, price, import/export, consumption and policy in China, as well as a forecast on the product's future trend. You definitely will get some refreshing information on the fluorine industry from the report.

## 1. Approach for this report

### Methodology

The report is drafted by diverse methods as follows:

#### 1) Desk research

The sources of desk research are various, including published magazines, journals, government statistics, industrial statistics, customs statistics, association seminars as well as information from the Internet. A lot of work has gone into the compilation and analysis of the obtained information. When necessary, checks have been made with all kinds of suppliers regarding market information such as key manufacturers, key end-users, production, consumption, export, demand and so on.

#### 2) Telephone interviews

CCM has carried out extensive telephone interviews in order to track the actual market situation of the fluorine industry in China.

Interviewees cover:

- Major manufacturers of fluorite
- Major manufacturers of inorganic fluorides
- Major manufacturers of organic fluorides
- Major manufacturers of semi-finished products
- Major manufacturers of finished products
- Major traders
- Associations

#### 3) Network search

CCM employs a network to contact industry participants by using B2B website and software.

#### 4) Data processing and presentation

The data collected and compiled is variously sourced from:

- CCM's database
- Published articles from periodicals, magazines, journals and third party databases
- Statistics from governments and international institutes
- Telephone interviews with domestic manufacturers, joint ventures, service suppliers and government agencies
- Third-party data providers
- Customs statistics
- Comments from industrial experts
- Information from the Internet

The data have been combined and cross-checked to make the report as accurate and methodologically sound as possible. Throughout the process, a series of discussions have been held within CCM to analyse the data and draw appropriate conclusions.

## - Glossary

CAGR: compound annual growth rate  
 AHF: anhydrous hydrogen fluoride  
 HCFC: hydrochlorofluorocarbon  
 HCFC-22: difluorochloromethane  
 HFC-134a: 1,1,1,2-tetrafluoroethane  
 HFC-32: difluoromethane  
 HFC-125: pentafluoroethane  
 HFC-410a: mixture of HFC-32 and HFC-125  
 HFP: hexafluoropropylene  
 PTFE: polytetrafluoroethylene  
 FEP: fluorinated ethylene propylene  
 PVDF: polyvinylidene fluoride  
 PFA: perfluoroalkoxy alkane  
 ETFE: ethylene tetrafluoroethylene  
 PFOA: pentadecafluorooctanoic acid  
 PE: polyethylene  
 FEPM: tetrafluoro ethylene/propylene rubbers  
 TFE: tetrafluoroethylene  
 PCTFE: polytrifluorochloroethylene

## - Unit

RMB: currency unit in China, also called Yuan  
 USD: currency unit in the US, also called US Dollar  
 Tonne: ton, equals to metric ton in this report  
 /t: per tonne  
 t/a: tonne per year, tonne per annual  
 kg: kilogram

Table Exchange rate of USD/CNY, Jan. 2011–Dec. 2019

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
2011	6.6027	6.5831	6.5662	6.5292	6.4988	6.4778	6.4614	6.4090	6.3833	6.3566	6.3408	6.3281	<b>6.4588</b>
2012	6.3168	6.3000	6.3081	6.2966	6.3062	6.3178	6.3235	6.3404	6.3395	6.3144	6.2953	6.2900	<b>6.3136</b>
2013	6.2787	6.2842	6.2743	6.2471	6.1970	6.1718	6.1725	6.1708	6.1588	6.1393	6.1372	6.1160	<b>6.1920</b>
2014	6.1043	6.1128	6.1358	6.1553	6.1636	6.1557	6.1569	6.1606	6.1528	6.1441	6.1432	6.1238	<b>6.1428</b>
2015	6.1272	6.1339	6.1507	6.1302	6.1143	6.1161	6.1167	6.3056	6.3691	6.3486	6.3666	6.4476	<b>6.2288</b>
2016	6.5527	6.5311	6.5064	6.4762	6.5315	6.5874	6.6774	6.6474	6.6715	6.7442	6.8375	6.9182	<b>6.6425</b>
2017	6.8918	6.8713	6.8932	6.8845	6.8827	6.8019	6.7772	6.7148	6.5909	6.6493	6.6300	6.6067	<b>6.7662</b>
2018	6.5079	6.3045	6.3352	6.2764	6.3670	6.4078	6.6157	6.8293	6.8347	6.8957	6.9670	6.9431	<b>6.6070</b>
2019	6.8482	6.7081	6.6957	6.7193	6.7344	6.8896	6.8716	6.8938	7.0883	7.0726	7.0437	7.0262	<b>6.8826</b>

Source: The People's Bank of China

## 1. Executive summary

According to statistics from the United States Geological Survey, China's fluorite reserves rank third in the world, with the volume of XXX million tonnes in 20XX. Since the end of 20XX, environmental protection policies have been tightened in China. As a result, the price of fluorite has risen sharply; some companies have therefore tried their best to tap the potential for production. However, domestic fluorite output only increased slightly in 20XX, with XXX million tonnes achieved.

The manufacturers had to turn to imported fluorite. In 20XX, the import volume was XXX tonnes, a dramatic year-on-year surge of XXX%.

With the shortage of fluorite in China, all the downstream products have experienced rocketing prices since 20XX, and reached the highest (in the past six years) in or around April 20XX. In 20XX, the prices fell in general, but still at high level.

The market of aluminum fluoride turned weak since 20XX, with an output of XXX tonnes in 20XX. It is affected by the low demand from electrolytic aluminum industry. The cryolite, as an auxiliary product in aluminum industry, encountered unfavored situation also, with output of XXX tonnes in 20XX, XXX% drop year on year.

Fluoride refrigerant production consumes a large part of fluorite supply in China. Although HCFC-22 will be phased out soon, it was still the largest fluoride refrigerant in 20XX, with an output of XXX tonnes.

Domestic fluoride refrigerant giants have already started to prepare for future competition since 20XX. For example, Zhejiang Juhua Co., Ltd. enlarged the capacity of HFC-32 and HFC-410a to XXX t/a and XXX t/a respectively in 20XX. Zhejiang Sanmei Chemical Co., Ltd. enlarged its HFC125 capacity to XXX t/a in 20XX.

PTFE, PVDF and HFP are the main fluoride polymers in China, with output of XXX tonnes, XXX tonnes and XXX tonnes respectively in 20XX.

It is estimated that supply shortage will continue to drive fluorite price up in 20XX. Although in the long term the industry keeps prosperous, more fluctuations in price will be witnessed, like in the recent two years.

The use of HFC-410a and others HFCs in domestic air conditioners is expected to increase slightly in 20XX, and this upward trend will continue in 20XX and 20XX. Of course, the growth is also closely related to the progress of HCFC-22 phased-out in the next three years.

Although the output of PTFE has shown a downward trend in 20XX–20XX, it is believed that the trend will be reversed in the next two to three years, which would be facilitated by the ban on imported waste plastics.

CCM also needs to point out that domestic manufacturers have been enlarging their product category, improving product performance and grade, and advancing into production of other copolymers.

## 1. What's in this report?

**Note: Key data/information in this sample page is hidden, while in the report it is not.**

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## 2 Fluorite supply in China

### 2.2 Production situation of fluorite

Since the end of 20XX environmental protection policies have been tightened, and some mining companies that failed to meet environmental protection standards were forced to suspend production. Those companies lacking funds to invest in environmental protection equipment were one part of them. Another part was forced into suspension due to the government's refusal to extend their mine safety production licenses (issued every three years). Strict supervision on the industry has led to a continuous decline in the active production capacity during 20XX–20XX. In addition, it is difficult to obtain approval for the explosives required for fluorite mining, and suspension of the failed enterprises in environmental assessment, which were engaged in flotation process, has also contributed to low-load operation. The year 20XX, in particular, experienced a significant decline in fluorite output.

In 20XX, effective production capacity continued to decline. As a result, the price of fluorite rose sharply, and therefore some companies tapped their potential to the best. However, due to stringent environmental protection policies, the national fluorite output only increased slightly.

The high pressure of environmental protection supervision in 20XX continued, leading another batch of small mines to withdraw completely.

Figure 2.2-2 Fluorite production in 20XX–20XX



Source: CCM

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## 4 Organic fluorides in China

### 4.1 Fluoride refrigerants

#### 4.1.1 HCFC-22

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##### 4.1.1.2 Price

From Sept. 20XX to Nov. 20XX, the ex-works price rocketed to USDXXX/t from USDXXX/t. Driving forces are environmental inspections on fluorite production, which led to the insufficient supply of fluorites, and the restricted production and use of HCFC-22.

The rise in HCFC-22 price was mainly affected by three factors. Firstly, the overall production and use quotas of HCFC-22 in 20XX were slightly lower than those in 20XX, resulting in tight supply of HCFC-22 and price rising in the first half of 20XX. Secondly, because of the tight supply of HFC-410a, domestic air-conditioning industry had to use more HCFC-22, which gave HCFC-22 manufacturers a chance to raise the price. Accordingly, a marked rise in domestic HCFC-22 price took place from Sept. to Nov. 20XX. Thirdly, upstream raw materials fluorite and AHF saw their prices increase, which directly contributed to the rise in the price of HCFC-22.

In 20XX, the Ministry of Ecology and Environment released the "Announcement of the 20XX HFC Production and Use Quotas, CTC Reagents and Auxiliary Use Quotas, and HFC Import Quota Approval Scheme". HCFC-22 production quota reduced from XXX tonnes in 20XX to XXX tonnes in 20XX.

Based on the decline in quota, an overall supply shortage in HCFC-22 market will continue in 20XX.

In Dec. 20XX, the price of HCFC-22 fell to USDXXX/t. Affected by the Sino-US trade dispute, desire for Chinese commodities, such as air conditioner and plastic products had weakened.

Figure 4.1.1.2-11 Monthly ex-works price of HCFC-22 in China, Jan. 20XX–Dec. 20XX



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## 4 Organic fluorides in China

### 4.2 Fluoride polymers

#### 4.2.1 PTFE

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##### 4.2.1.3 Export and import

From 20XX to 20XX, the import and export volume of PTFE in China fluctuated in a relatively small range. Overall, the import and export volume of PTFE maintained at around XXX tonnes and XXX tonnes respectively. However, the gap between average import and export prices had gradually become large. Since 20XX, the average import price of PTFE had risen, while the average export price of PTFE had declined. This is due to redundant construction and vicious competition in the domestic PTFE market, resulting in the overflow of low-end products domestically and dependence on imported high-end products.

The export volume of PTFE was XXX tonnes in China in 20XX, with the average price of USDXXX/kg; the import volume was XXX tonnes, with an average price of USDXXX/kg.

Table 4.2.1.3-21 Imports and exports of PTFE in China, 20XX–20XX

Year	Import			Export		
	Volume, tonne	Value, USD	Price, USD/kg	Volume, tonne	Value, USD	Price, USD/kg
2011	XXX	XXX	XXX	XXX	XXX	XXX
2012	XXX	XXX	XXX	XXX	XXX	XXX
2013	XXX	XXX	XXX	XXX	XXX	XXX
2014	XXX	XXX	XXX	XXX	XXX	XXX
2015	XXX	XXX	XXX	XXX	XXX	XXX
2016	XXX	XXX	XXX	XXX	XXX	XXX
2017	XXX	XXX	XXX	XXX	XXX	XXX
2018	XXX	XXX	XXX	XXX	XXX	XXX
Jan.–Nov. 2019	XXX	XXX	XXX	XXX	XXX	XXX

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## 4 Organic fluorides in China

### 4.1 Fluoride refrigerants

#### 4.1.1 HCFC-22

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##### 4.1.1.5 Future trends

According to the commitments of Chinese government made in MPMFEC, China will cut down XXX% of HCFCs use by 20XX, XXX% by 20XX and be phased out by 20XX. Taking HCFC-22 as an example, in 20XX, domestic production quota of HCFC-22 decreased to XXX tonnes from XXX tonnes in 20XX, and will fall to XXX tonnes around 20XX. In 2030, HCFC-22 will not be allowed as an air conditioner refrigerant.

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