CCM Data & Business Intelligence

Survey of Fluorine Industry in China

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1. Introduction

The report reveals the policies and environmental regulatory actions in fluorine industry and analyses their impacts on production, producers, prices and consumption of fluorine in China. The main products for this study consist of fluorite, inorganic fluoride, fluorohydrocarbon and fluor polymer.

Region scope: China
Time scope: 2011–2017

2. Approach in this report

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, 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 Chinese suppliers regarding production information.

2. Telephone interviews

CCM has carried out extensive telephone interviews in order to survey the market of fluorine industry in China.
Interviewees cover the following:

- Key producers
- Key traders
- Material suppliers
- Associations
- Experts

Data processing and presentation

- The data collected and compiled are sourced from:
- CCM's database, ValoTracer
- Published articles from periodicals, magazines and journals, and third-party databases
- Statistics from governments and international institutes
- Telephone interviews with domestic producers, service suppliers, governments, etc.
- Third-party data providers
- Comments from industrial experts
- Professional databases from other sources
- Information from the internet

The data from various sources have been combined and cross-checked to make this report as precise and scientific as possible. Throughout the process, a series of internal discussions took place in order to analyse the data and draw conclusions from them.

3. Executive summary

Fluorine industry has been one of the fastest developing and most promising chemical industries in China. China has become one of the largest fluorine production and consumption areas. There are four important sectors for China's fluorine industry, consisting of inorganic fluoride, fluor-refrigerant, fluor polymer and fluor-intermediate.

China is the country that has the highest proven fluorite reserves. In 2016, it had recoverable fluorite reserves of about XXX million tonnes, next to South Africa. In 2016, the output of fluorite in the world is about XXX million tonnes, down by about XXX% year on year. China remains the largest fluorite producer with XXX million tonnes of output in 2016, accounting for more than XXX% of global total. Most of China's fluorite deposits are associated fluorite deposits, and the monomineral-fluorite deposits are relatively scarce. It is obviously that the available resources are limited.

In order to protect the fluorite resources, China has established fluorite industry access standards and carried out related policies to restrict the exploration and export of fluorite. The threshold for the entry of fluorite mining industry is getting higher and higher. With further integration of fluorite industry, small-scale manufacturers and the ones with inefficient technology are facing the situation to be eliminated. At the same time, the downstream industries of fluorine are continuously transformed and upgraded. Chinese government aims to raise the overall technical level of the industry, develop high value-added products and extend the industrial chain.

Since H2 2016, the Chinese government has paid much attention to environmental protection. In terms of the production safety risk and environmental pollution problems in the fluorine industry, China conducted frequent regulatory investigation. In particular, the fourth-round environmental inspection and the inspection of production safety from August to October 2017 cover fluorine companies across the country. Fluorite mining industry was impacted the most. Many small and medium-size fluorite enterprises were shut down. The overall operating rate of the fluorite industry enjoyed restrictions and progress of the industry consolidation has been accelerated.

As of H1 2017, there were more than XXX fluorite producers in China. More than XXX% of them are private enterprises, among which most are in a small scale. The specifications and prices of fluorite produced by these small-scale enterprises vary from each other, which causes chaos in China's fluorite market.

As the largest producer of anhydrous hydrogen fluoride (AHF) in the world, China witnessed rapid development of AHF in the past five year. But the large expansion of AHF capacity has led to the current overcapacity. In 2016, there were more than XXX AHF manufacturers in China, and the domestic capacity and output of AHF reached XXX t/a and XXX tonnes respectively. In addition, China's electronic grade hydrogen fluoride has also developed rapidly. There are about XXX producers of electronic grade hydrogen fluoride in China, and the domestic capacity and output of electronic grade hydrogen fluoride reached XXX t/a and XXX tonnes respectively.

China is also the largest producer of aluminum fluoride and cryolite in the world. In 2016, the domestic capacity of aluminum fluoride and cryolite were XXX t/a and XXX t/a respectively. At present, both aluminum fluoride and cryolite industries suffer from overcapacity. Meanwhile, production of lithium hexafluorophosphate developed fast in the past five years and its capacity reached XXX t/a in 2016. It's expected that the growth momentum will continue with the rapid development of new energy vehicles. The capacity of potassium fluoride was XXX t/a, while that of sodium fluoride was over XXX t/a in the same year.

There were about XXX fluorine refrigerant manufacturers with a total capacity of more than XXX million t/a in China in 2015. At present, the main fluorine refrigerants in China are HCFC-22, HFC-134a, HFC-32, HFC-125 and HFC-410a. With the capacity and output of XXX t/a and XXX tonnes respectively in 2016, HCFC-22 is still a major refrigerant in China. However, due to the elimination of HCFCs according to the Montreal Protocol, the production of HCFC-22 has been restricted and its consumption as a refrigerant has been decreasing.

HFC-410a has been a substitute for HCFC-22. However, HFC-410a is not the final alternative to HCFC-22 because HFC-410a still contains fluorine atoms. Therefore, Chinese refrigerant enterprises have been actively looking for safer and more environmentally friendly refrigerants. It's estimated that more low-fluoride or even non-fluoride refrigerants will come out in the coming few years.

There are two main varieties of fluor polymer in China, including fluor resin and fluor rubber. The fluor polymer industry, especially fluor resin, is developing very quickly in China but facing many problems such as the inefficient technology and the lack of high-end products.

PTFE is the principal product of fluor resins in China, followed by FEP and PVDF. Fluor resins are widely used in coatings, sealing, architecture, electronic and other fields.

In recent years, along with the development of automobile and petrochemical industry, the fluor rubber develops rapidly with an output of XXX tonnes in 2016. However, lack of varieties and backward processing technology has constrained the development of the fluor rubber industry in China.

4. 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

2.2 Production of fluorite in China

From 2011 to 2016, recoverable fluorite reserves in China had been increasing as a whole at a CAGR of XXX%. In 2016, the identified recoverable fluorite reserves in the country were about XXX million tonnes.

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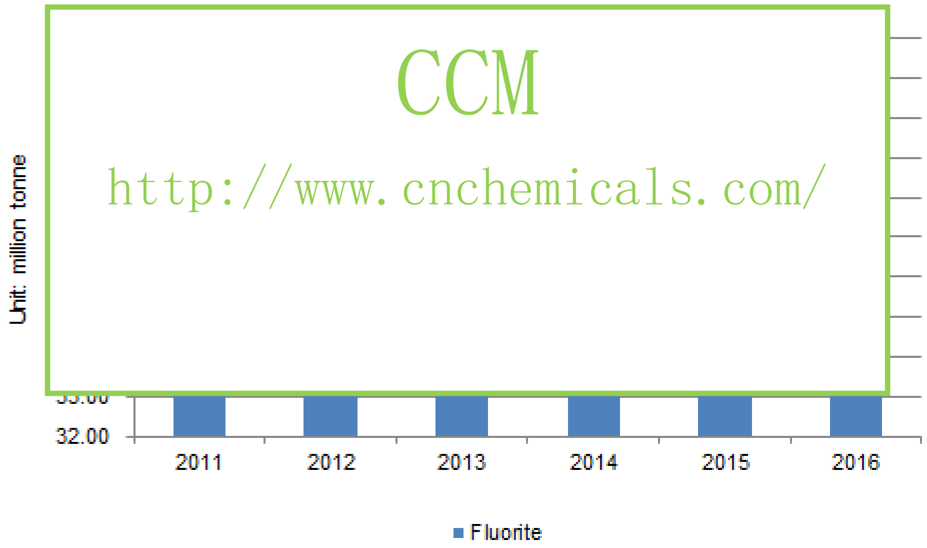
Figure 2.2-1 Recoverable fluorite reserves in China, 2011–2016



Note: The data in 2016 is estimated based on the data from USGS.

Source: National Bureau of Statistics of People's Republic of China, USGS, CCM

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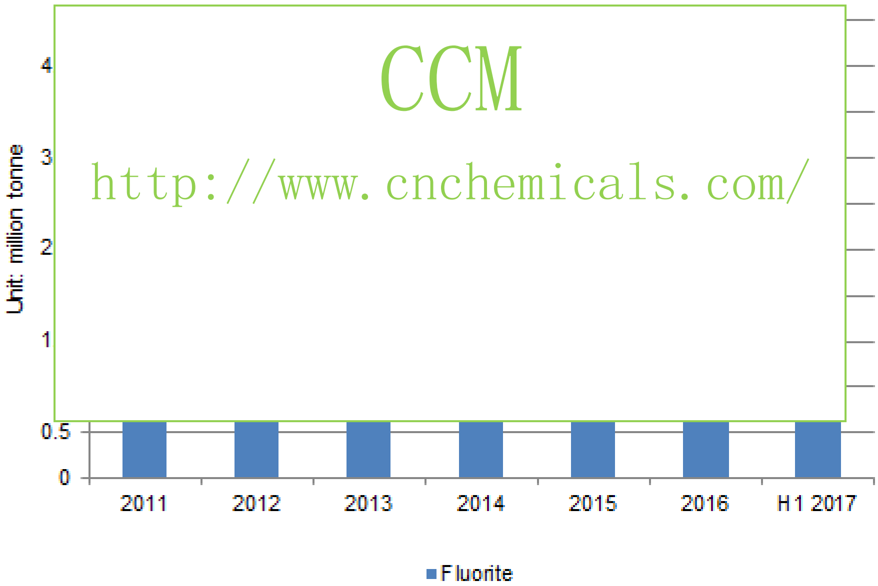
Figure 2.2-2 Output of fluorite in China, 2011–H1 2017



Note: 1.The data in H1 2017 is estimated.

2.Statistical fluorite products include high grade fluorite lump ore (CaF2≥65%), metallurgical grade fluorite powder (CaF2≥75%) and acid grade fluorite powder (CaF2≥97%).

Source: USGS, CCM

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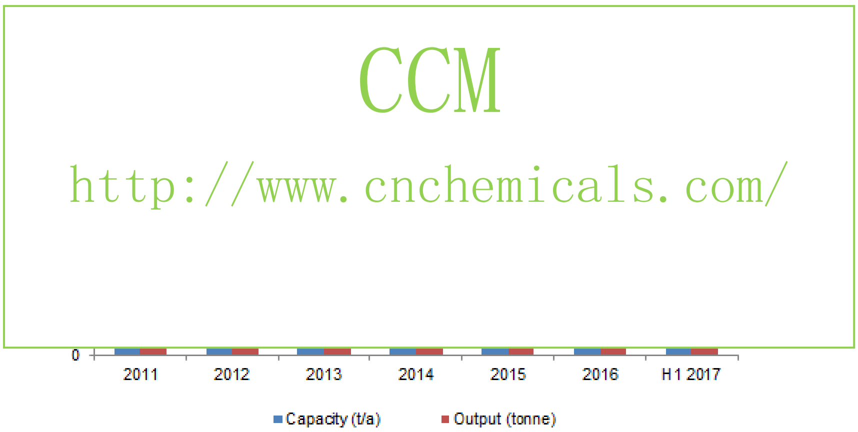
3 Inorganic fluoride in China

3.1 Anhydrous hydrogen fluoride (AHF)

- Production of AHF in China

Figure 3.1-1 Capacity and output of AHF in China, 2011–H1 2017



Source: CCM

- Production of electronic grade hydrogen fluoride in China

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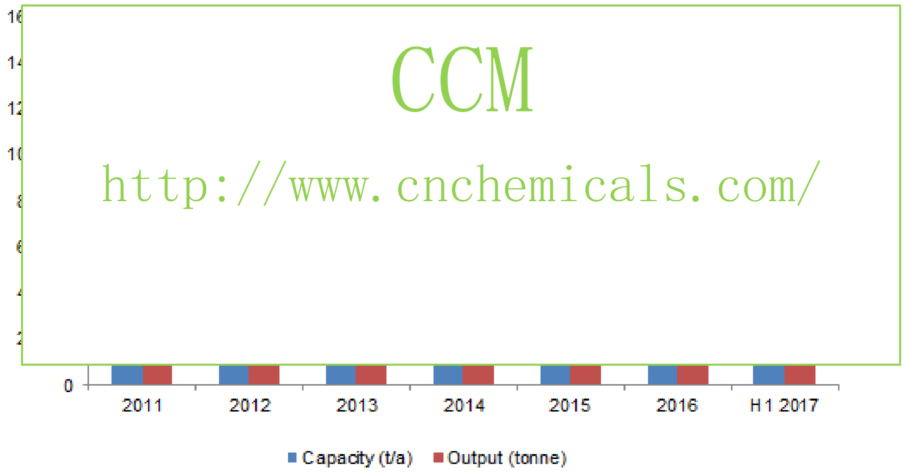
In recent years, the domestic electronic grade hydrogen fluoride industry saw rapid development. The capacity and output of electronic grade hydrogen fluoride in China increased from XXX t/a and XXX tonnes in 2011 to XXX t/a and XXX tonnes in 2016, with CAGRs of XXX% and XXX% respectively.

Figure 3.1-2 Capacity and output of electronic grade hydrogen fluoride in China, 2011–H1 2017



Source: CCM

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- Imports and exports of China's AHF

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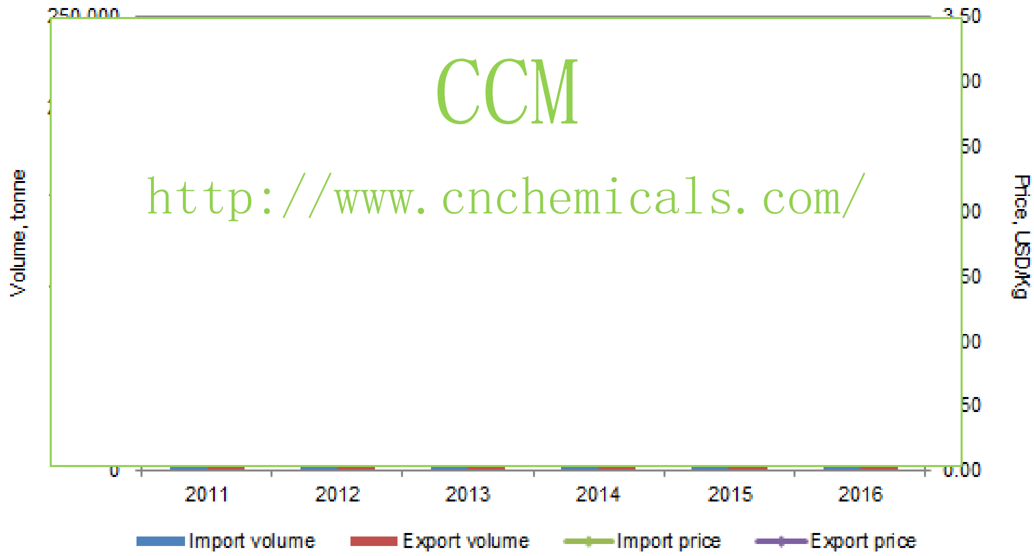
Figure 3.1-5 China's imports and exports of AHF, 2011–2016



Source: China Customs & CCM

Table 3.1-3 Imports and exports of AHF in China, 2011–2016

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

Source: China Customs & CCM

Table 3.1-4 China's exports of AHF by destination, 2016

No.	Destination	Export volume, tonne	Export value, USD	Export price, USD/kg
1	XXX	XXX	XXX	XXX
2	XXX	XXX	XXX	XXX
3	XXX	XXX	XXX	XXX
…	XXX	XXX	XXX	XXX
…	XXX	XXX	XXX	XXX
…	XXX	XXX	XXX	XXX
Others		XXX	XXX	XXX
Total		**XXX**	**XXX**	**XXX**

Source: China Customs & CCM

4.2.1 Situation of HCFC-22

- Consumption

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Figure 4.2.1-3 Consumption pattern of HCFC-22 in China, 2016

Note: 1. New air conditioner refers to the air conditioner with HCFC-22.

2. Others include insecticides and aerosol spray.

Source: CCM

5 Fluor polymer in China

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5.1.2 Production and market situation of major products

1) Polytetrafluoroethylene (PTFE)

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Table 5.1.2-1 Capacity and output of major PTFE producers in China, 2016

No.	Producer	Capacity (t/a)	Output (tonne)	Operating rate
1	XXX	XXX	XXX	XXX
2	XXX	XXX	XXX	XXX
3	XXX	XXX	XXX	XXX
4	XXX	XXX	XXX	XXX
5	XXX	XXX	XXX	XXX
6	XXX	XXX	XXX	XXX
…	…	XXX	XXX	XXX
Others		XXX	XXX	XXX
Total		XXX	XXX	XXX

Source: CCM

- Imports and exports of PTFE in China

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Table 5.1.2-2 Imports and exports of PTFE in China, 2011–2016

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

Source: CCM & China Customs

- Price of PTFE in China

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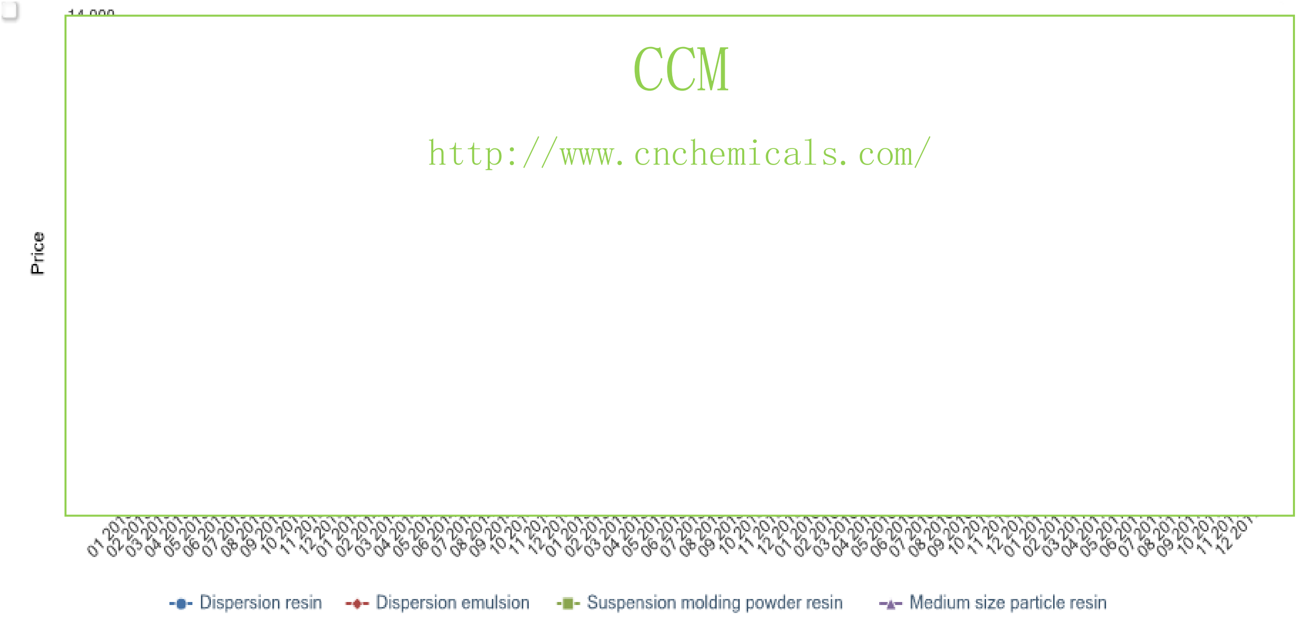
Figure 5.1.2-2 Monthly ex-works price of PTFE in China, Jan. 2013–Dec. 2017



Source: CCM

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