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Fluorochemical Industry

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第一章 经济概况

Chapter 1. Economy Overview

1.1 世界经济概况

1.1 Global Economy Overview

根据 2019 年 4 月的《世界经济展望》(WEO)统计的数据, 全球经济增长速度在 2017 年达到接近 4%的峰值, 2018 年放缓至 3.6%。预计 2019 年将进一步降至 3.3%, 2020 年全球经济增长回升至 3.6%。

According to the world economic outlook (WEO) for April 2019, global economic growth peaked near 4 % in 2017 and slowed to 3.6 % in 2018. It is expected to fall further to 3.3 % in 2019 and pick up to 3.6 % in 2020.

2018 年, 中美贸易紧张局势升级, 阿根廷和土耳其的宏观经济承压, 德国汽车产业出现中断, 中国信贷政策收紧, 随着大型发达经济体的货币政策正常化出现的金融条件收紧共同导致了全球扩张的显著减弱, 尤其是 2018 年下半年。鉴于这种疲弱态势预计将延续至 2019 年上半年, 预计下半年增速将会回升。其支撑因素是在没有通胀压力的情况下, 主要经济体可以实施大规模宽松政策, 尽管产出缺口正在收缩。

In 2018, rising trade tensions between China and the United States, macroeconomic pressures in Argentina and Turkey, disruptions in the German automotive industry, and tighter credit policies in China, combined with tighter financial conditions as monetary policy normalizes in large developed economies, had led to a significant weakening of global expansion, especially in the second half of 2018. With this weakness expected to continue into the first half of 2019, growth is expected to pick up in the second half. This is underpinned by the ability of major economies to

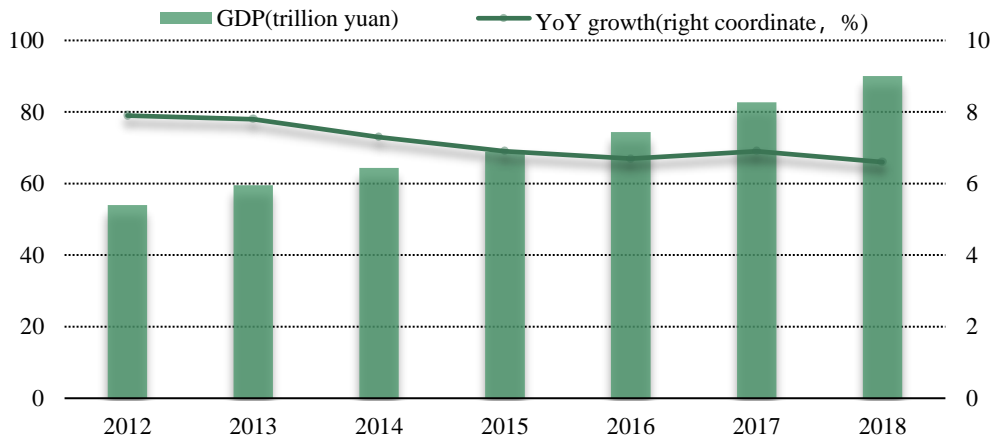
undertake large-scale easing in the absence of inflationary pressures, even though the output gap is shrinking.

1.2 中国经济概况

1.2 Chinese Economy Overview

据统计局核算，2018年，中国国内生产总值（GDP）900309亿元，按可比价格计算，比上年增长6.6%，实现了6.5%左右的预期发展目标。分季度看，一季度同比增长6.8%，二季度增长6.7%，三季度增长6.5%，四季度增长6.4%，见图1。分产业看，第一产业增加值64734亿元，比上年增长3.5%；第二产业增加值366001亿元，增长5.8%；第三产业增加值469575亿元，增长7.6%。对此，统计局表示，总的来看，2018年，国民经济继续运行在合理区间，实现了总体平稳、稳中有进。

According to the preliminary accounting, the GDP in 2018 is expected to be RMB90.0309 trillion, up 6.6% over 2017. In the first quarter, year-on-year growth was 6.8%, 6.7% in the second quarter, 6.5% in the third quarter and 6.4% in the fourth quarter. By industry, the added value of the primary industry reached 6473.4 billion yuan, an increase of 3.5% over the previous year. The added value of the secondary industry reached 36.6001 trillion yuan, up by 5.8%. The added value of the tertiary industry reached 4,6957.5 billion yuan, up 7.6%. The national economy continued to operate within a reasonable range in 2018, achieving overall stability and making progress.



数据来源：CAFSI/ACMI

Data source: CAFSI/ACMI

图 1 2012-2018 年中国国内生产总值及其增长速度
 Figure 1. China's GDP and the growth rate in 2012-2018

第 2 章 萤石行业

Chapter 2. Fluorite

萤石，又称氟石，是氟化钙的结晶体。作为化学氟元素的主要来源，工业上常用浓硫酸与酸级萤石精粉来提取氟元素，是氟化工产业链中的重要原料。

Fluorite, also called fluorspar, is the crystal of calcium fluoride, and it's an important raw material in fluorochemical industry. The most widely used method to extract fluorine in chemical industry is to make concentrated sulfuric acid react with acid grade fluorite.

全球萤石资源分布广泛。根据 USGS(美国地质勘探局)估算，截至 2018 年底，全球萤石储量达到 3.1 亿吨。墨西哥萤石资源储量占全球首位，为 6800 万吨，占全球总储量的 21.9%。中国和南非的萤石储量分别为 4200 万吨、4100 万吨，分别占全球总储量的 13.5%、13.2%。

Fluorite resources are widely distributed around the world. According to the estimation of USGS (United States Geological Surve), the fluorite reserves all over the world reach 310 million

tons by the end of 2018. Mexico leads the world in fluorite reserves, with 68 million tons, accounting for 21.9% of the world's total reserves. The fluorite reserves of China and South Africa are 42 million tons and 4100 million tons, respectively, accounting for 13.5% and 13.2% of the world's total reserves.

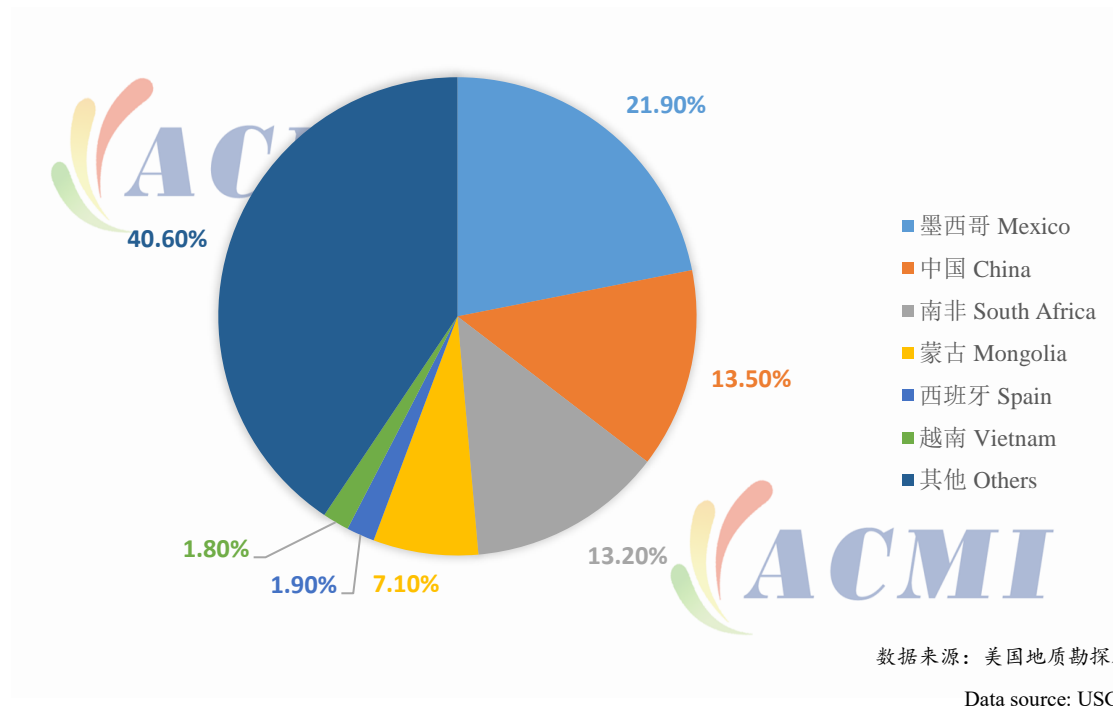


图 2 2018 年全球萤石资源分布
Figure 2. Distribution of Global Fluorite Resources in 2018

2.1 中国萤石生产现状

2.1 Production of Chinese Fluorite

近十年来，尽管中国的萤石储量仅占全球总量的 13.5% 左右，但产量和出口量却长期占据全球总量的 50% 以上，储采比远低于全球平均水平。2010 年，七部委联合发布《萤石行业准入标准公告》设置行业门槛以促进产业结构调整，至今被批准的生产线共三批，仅 35 条，合计批准产能 10320 吨/日，具体如表 1 所示。

In recent decade, China produces and exports more than 50% of the world's fluorite, while its reserves only accounts for 13.5% of the total, which means the reserve-production ratio of China

is far below the global average level. In 2010, seven ministries and commissions jointly issued the “Announcement of fluorite industry access standards” to set industry thresholds to promote industrial restructuring. Up to now, 35 production lines have been approved in three batches, with a total capacity of 10320 tons per day. Table 1 shows the details of these production lines.

表 1 符合萤石行业准入标准生产线名单

Table 1 list of fluorite production lines have been approved

企业名称 Company name	生产线名称 Production line	单线规模 (吨/日) Single line scale (ton/day)
第一批/ First Batch		
金华市精选矿业有限公司 Jinhua Selective Mining Co.Ltd	金华市精选矿业有限公司生产线 Production line of Jinhua Selective Mining	150
浙江省东阳市矿业有限责任公司 Dongyang Mining Co., Ltd	浙江省东阳市矿业有限责任公司佐村萤石矿采选生产线 Zuocun fluorite mining production line of Dongyang Mining	200
浙江武义神龙浮选有限公司 Zhejiang wuyi shenlong floatation Co.,Ltd	浙江武义神龙浮选有限公司萤石采选生产线 Fluorite production line of Zhejiang wuyi shenlong floatation Co.Ltd	200
龙泉市磷矿有限公司 Longquan fluorite Mine Co.,Ltd	龙泉市磷矿有限公司萤石矿采选生产线 Fluorite production of Longquan fluorite mine Co.,Ltd	320
旌德县新义萤石有限公司 Jingde xinyi fluorite Co.,Ltd	旌德县新义萤石有限公司清正萤石矿新义一矿生产线 Xinyi No.1 production line of Jingde xinyi fluorite Co.,Ltd	200
邵武市正诚矿业有限公司 Shaowu Zhengcheng Mining Co., Ltd	邵武市正诚矿业有限公司南山下萤石矿采选生产线 Nanshan Fluorite Mining and processing production line of Shaowu Zhengcheng Mining Co., Ltd	450
顺昌县埔上萤石有限公司 Shunchang Pushang fluorite Co., Ltd	顺昌县埔上萤石有限公司萤石采选生产线 Fluorite production line of Fushang fluorite Co., Ltd	130
玉山县三山矿业有限公司 Yushan Sanshan Mining Co., Ltd	玉山县三山矿业有限公司萤石选矿厂 Fluorite concentrator of Yushan Sanshan	130

Mining Co., Ltd		
湖南旺华萤石矿业有限公司 Hunan Wanghua Fluorite Mining Co., Ltd	湖南旺华萤石矿业有限公司萤石采选生产线 Fluorite production line of Hunan Wanghua Fluorite Mining Co., Ltd	400
湖南鑫源矿业有限公司 Hunan Xinyuan Mining Co., Ltd	湖南鑫源矿业有限公司萤石采选生产线 Fluorite production line of Hunan Xinyuan Mining Co., Ltd	330
第二批/ Second Batch		
遂昌凯圣矿业开发有限公司 Suichang Kaisheng Mining Development Co., Ltd	白坛下萤石矿采选生产线 Baitanxia fluorite mine production line	150
浙江遂昌正中萤石精选有限公司 Zhejiang Suichang Zhengzhong Yingshi selection Co., Ltd	萤石采选生产线 Fluorite production line	660
永丰县天宝矿业有限公司 Yongfeng Tianbao Mining Co., Ltd	中富萤石矿采选生产线 Zhongfu fluorite ore production line	500
江西永丰县金丰萤石有限公司 Jiangxi Yongfeng Jinfeng fluorite Co., Ltd	北坑萤石矿采选生产线 Production line of Beikeng fluorite mine	400
德兴市万源矿业有限公司 Dexing Wanyuan Mining Co., Ltd	萤石采选生产线 Fluorite production line	150
江西会昌县石磊矿业有限责任公司 Jiangxi Huichang Shilei Mining Co., Ltd	筠门岭萤石一矿采选生产线 Production line of No.1 fluorite mine in junmenling	100
兴国县中萤矿业有限公司 Xingguo Zhongfu Mining Co., Ltd	隆坪萤石矿采选生产线 Longping fluorite production line	260
瑞金市绵江萤矿有限公司 Ruijin Mianjiang Fluorite Mine Co., Ltd	萤石采选生产线 Fluorite production line	210
洛阳氟钾科技有限公司 Luoyang Fluoride Potassium Technology Co.Ltd	萤石采选生产线 Fluorite production line	500
湖南有色郴州氟化学有限公司 Hunan Nonferrous Chenzhou Fluorine Chemistry Co.Ltd	萤石精粉生产线 Fluorite powder production line	330

中铁二院工程集团彭水渝东矿业开发
有限公司

China Railway Eryuan Engineering Group Pengshui Yudong Mining Development Co., Ltd	萤石重晶石洗选加工生产线 Fluorite barite washing and processing line	500
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务川东升矿业有限责任公司 Wuchuan Dongsheng Mining Co., Ltd	萤石采选生产线 Fluorite production line	170
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务川东升矿业有限责任公司 Wuchuan Dongsheng Mining Co., Ltd	萤石重晶石分选加工生产线 Fluorite barite separation and processing line	660
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第三批/Third Batch

金华东方萤石有限公司 Jinhua Oriental fluorite Co., Ltd	杨家萤石浮选生产线（一线） Yangjia fluorite flotation production line (first line)	250
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金华东方萤石有限公司 Jinhua Oriental fluorite Co., Ltd	杨家萤石浮选生产线（二线） Yangjia fluorite flotation production line (second line)	250
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浙江武义三联实业发展有限公司 Zhejiang Wuyi Sanlian Industrial Development Co., Ltd	莲塘口萤石精矿选矿生产线（一线） Liantangkou fluorite concentrate Beneficiation Production Line (first line)	300
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浙江武义三联实业发展有限公司 Zhejiang Wuyi Sanlian Industrial Development Co., Ltd	莲塘口萤石精矿选矿生产线（二线） Liantangkou fluorite concentrate Beneficiation Production Line (second line)	300
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仙居县华莹矿业有限公司 Xianju Huaying Mining Co., Ltd	下林树萤石浮选生产线 Xialinshu fluorite flotation production line	150
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浙江大金庄矿业有限公司 Zhejiang dajinzhuang Mining Co., Ltd	横坑坪萤石采选生产线 Hengkengping fluorite production line	600
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福建省浦城县萤达矿业有限公司 Fujian Pucheng Yingda Mining Co., Ltd	洋溪萤石矿采选生产线 Yangxi fluorite production line	100
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福建省浦城县龙和矿业有限责任公司 Fujian Pucheng Longhe Mining Co., Ltd	东峰萤石选矿生产线 Dongfeng fluorite Beneficiation Production Line	200
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德安县永飞矿业有限公司 De'an Yongfei Mining Co., Ltd	萤石矿开采加工及石灰石综合利用项目 Fluorite Mining and processing and limestone comprehensive utilization project	220
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华星氟化学有限公司 Huaxing Fluorine Chemical Co., Ltd	小叶崇林场萤石浮选生产线（一线） Fluorite flotation production line of xiaoyedong Forest Farm (first line)	100
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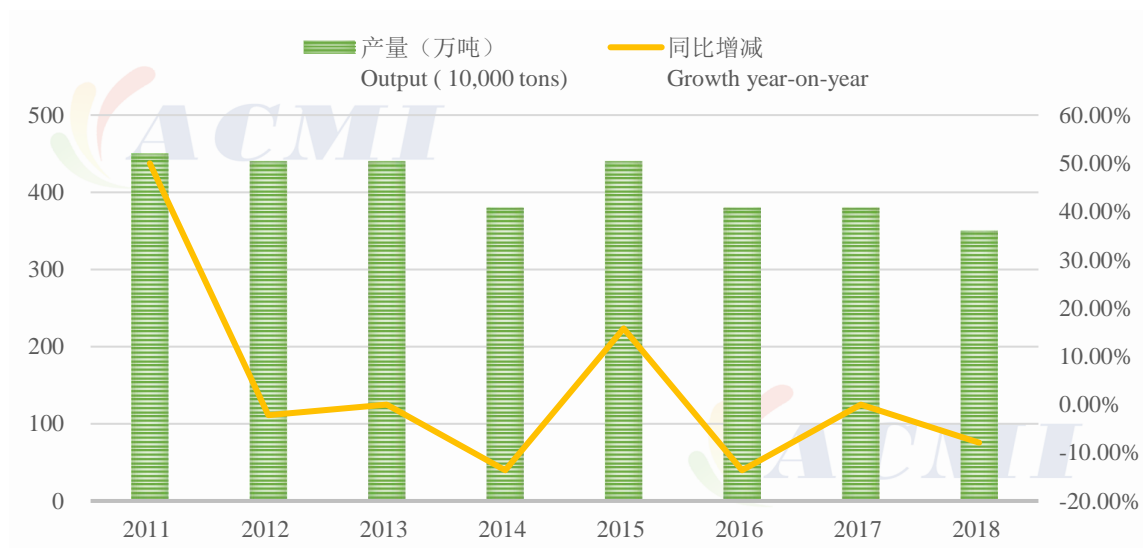
华星氟化学有限公司 Huaxing Fluorine Chemical Co., Ltd	樟树萤石浮选生产线（一线） Zhangshu fluorite flotation production line (first line)	100
洛阳丰瑞氟业有限公司 Luoyang Fengrui Fluorine Industry Co., Ltd	龙潭萤石粉选矿生产线 Longtan fluorite powder processing line	650

数据来源：ACMI 整理

Data source: ACMI

2011 年，国土资源部下发《关于下达 2011 年高铝黏土和萤石矿开采总量控制指标的通知》并对我国萤石产量进行总量控制，图 3 所示为近年中国萤石产量。

In 2011, the ministry of land and resources issued the notice on total production control for high-alumina clays and fluorite mines, and since then, Chinese government start to control the total amount of fluorite production in the country. Figure 3 shows the outputs of fluorite in China in recent years



数据来源：ACMI 整理

Data source: ACMI

图 3 近 8 年中国萤石产量分布
Figure 3. Output of Chinese Fluorite in Recent 8 Years

2.2 中国萤石消费分析

2.2 Consumption of Chinese fluorite

根据产品中氟化钙的含量，萤石产品可分为四个品级，其中酸级萤石精粉是氟化工产业链的重要原料，是化学工业中氟元素的主要来源。表 2 所示为不同品级萤石的划分标准以及主要用途。

Fluorite products can be classified into four grades according to the content of calcium fluoride. Among them, acid-grade fluorite powder plays an important role in fluorochemical industry, which is the main source of fluorine element in industry. Table 2 shows the standard of classification and main uses of fluorite in different grade.

表 2 不同品级萤石的主要用途

Table 2. Main Use of Different Grades of Fluorite

品级 Grade	CaF ₂ 含量 (%) CaF ₂ Content (%)	主要用途 Main Use
酸级萤石精粉 Acid grade fluorite powder	≥97	氟化工产业链的原料 Raw material of fluorochemical industry
冶金级萤石精粉 Metallurgical-grade fluorite	≥75	钢铁等金属冶炼用的助熔剂、排渣剂 Flux and slag remover used in smelting of iron and steel
高品位萤石块矿 High grade fluorite ore	≥65	钢铁等金属冶炼、陶瓷、玻璃等生产 Steel and other metal smelting, production of ceramics, glass and so on
普通萤石原矿 Raw fluorite mineral	≥30	用于生产萤石精粉 raw material of fluorite powder

数据来源：ACMI 整理

Data source: ACMI

2018 年中国有 78% 的萤石产品是用于氟化工行业，是萤石的主要消费领域；其次是冶金工业，占比 12%；建材工业消费的萤石产品占总量的 7%，具体如图 3 所示。

In 2018, about 78% of fluorite products in China were used in fluorochemical industry, which

is the main consumption area of fluorite. Metallurgical industry followed, accounting for 12%. The construction industry consumes about 7% of fluorite, as Figure 4 shows.

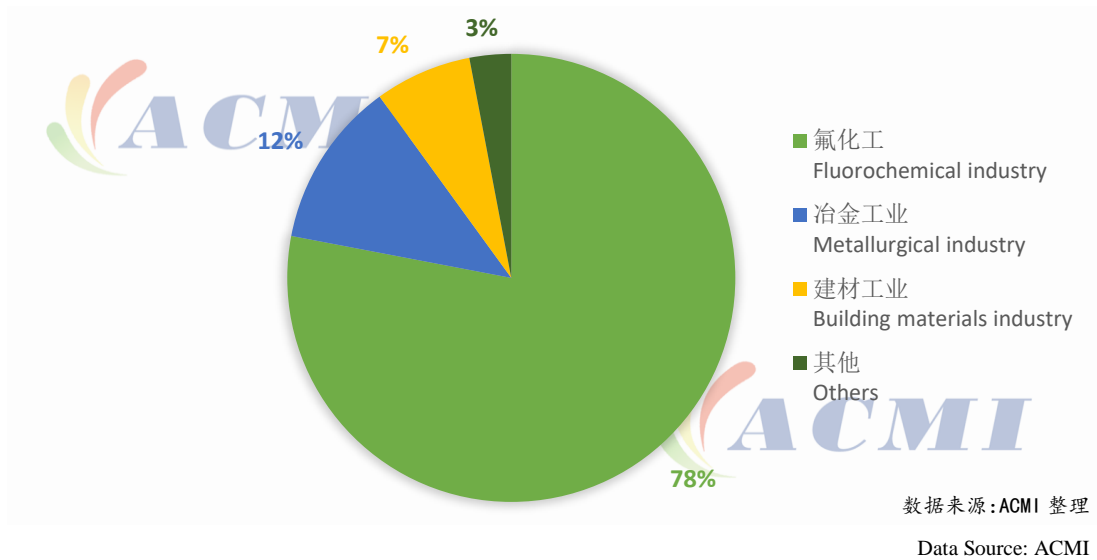


图 4 2018 年中国萤石消费结构
Figure 4. The consumption structure of Chinese Fluorite in 2018

2.3 中国萤石进出口贸易

2.3 Import and Export of Chinese Fluorite

在中国，萤石有两个海关商品编码，分别是：25292100（按重量计氟化钙含量 \leq 97%的萤石）和 25292200（按重量计氟化钙含量 $>$ 97%的萤石）。

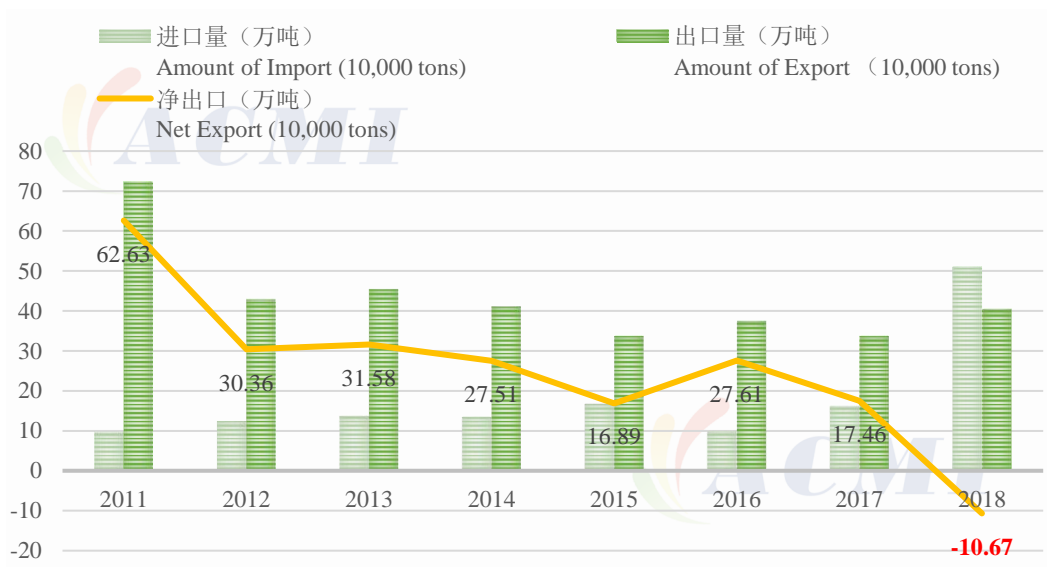
In China, fluorite has two customs commodity codes: 25292100 (fluorite with calcium fluoride content \leq 97% by weight) and 25292200 (fluorite with calcium fluoride content $>$ 97% by weight).

长期以来，中国是全球主要萤石出口国。随着近年来国家对萤石资源管控趋严以及我国氟化工产业的迅速发展，2018 年我国首次成为萤石净进口国家，净进口萤石总量 10.67 万吨。

图 4 所示为近年中国萤石进出口情况。

China was the world's leading exporter of fluorite in the last decade. With the increasingly

strict national control over fluorite resources in recent years and the rapid development of China's fluorochemical industry, China became a net importer of fluorite for the first time in 2018, with a total net import of 106,700 tons of fluorite. Figure 5 shows the import and export of fluorite in China in recent eight years.



数据来源：中国海关总署

Data Sources: China's customs

图 5 近年中国萤石进出口概况

Figure 5. Import and Export of Chinese Fluorite in recent years

2018 年, 25292100 (按重量计氟化钙含量 $\leq 97\%$ 的萤石) 的主要进口来源为蒙古、缅甸、墨西哥和日本, 如图 6 所示; 主要出口国为韩国、印度、日本、印度尼西亚和芬兰, 如图 7 所示。

In 2018, the main import sources of product 25292100 (fluorite with calcium fluoride content $\leq 97\%$ by weight) were Mongolia, Mexico and Japan, as shown in figure 6. Its main exporters are South Korea, India, Japan, Indonesia and Finland, as shown in figure 7.

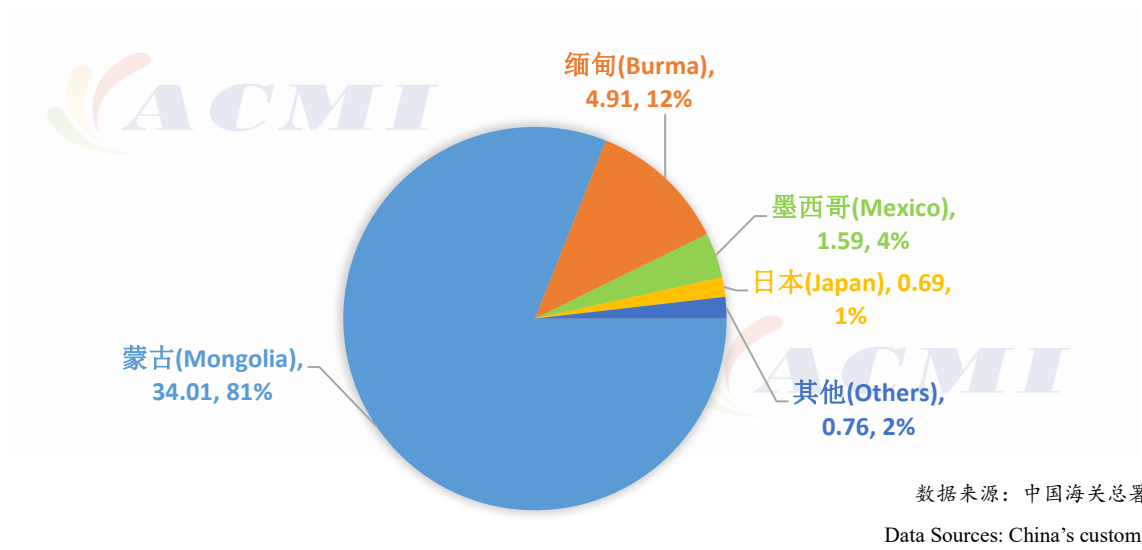


图 6 2018 年中国按重量计氟化钙含量≤97%的萤石进口来源（单位：万吨）
 Figure 6. Import source of fluorite with content of calcium fluoride≤97% by weight in 2018 (Unit: 10,000 tons)

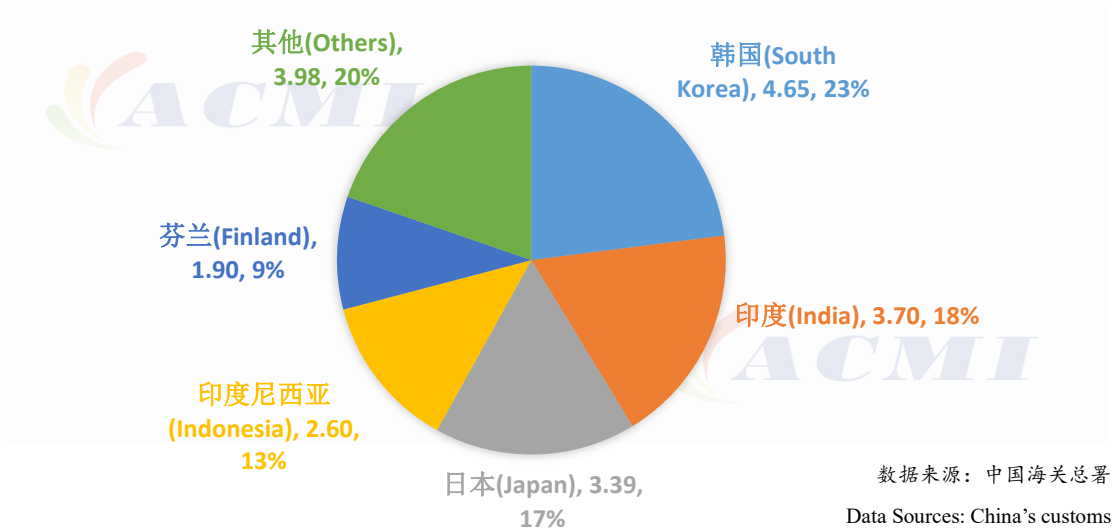


图 7 2018 年中国按重量计氟化钙含量≤97%的萤石出口分布（单位：万吨）
 Figure 7. Export destinations of fluorite with content of calcium fluoride ≤97% by weight in 2018 (Unit: 10,000 tons)

2018 年，25292200（按重量计氟化钙含量 > 97%的萤石）的主要进口来源为墨西哥、南非、缅甸、越南和蒙古，如图 8 所示；主要出口国为印度、日本、荷兰、德国和韩国，如

图9所示。

In 2018, product 25292200 (fluorite with > 97% of calcium fluoride by weight) were mainly imported from Mexico, South Africa, Burma, Vietnam and Mongolia, as shown in figure 8. Its main export destinations are India, Japan, the Netherlands, Germany and South Korea, as shown in figure 9.

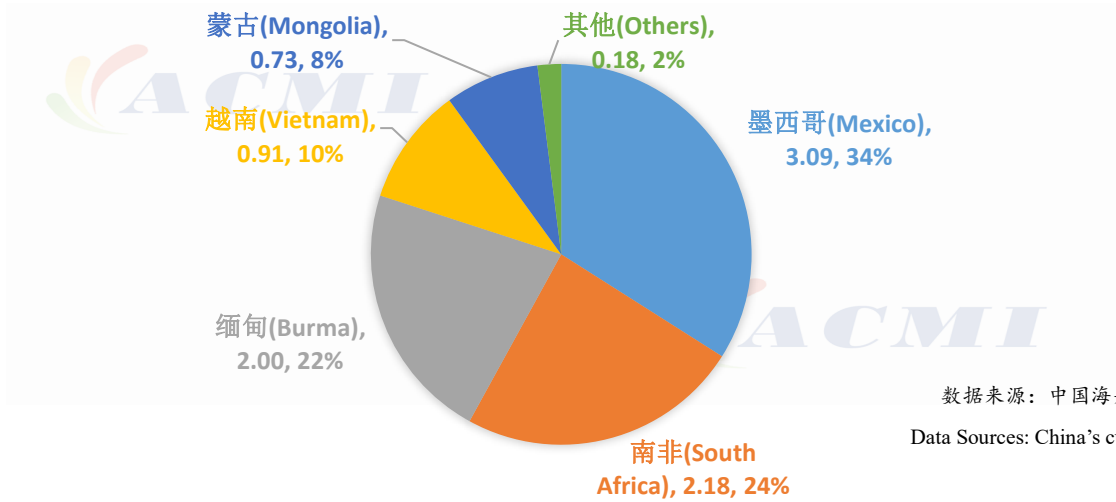


图8 2018年中国按重量计氟化钙含量>97%的萤石进口来源(单位:万吨)

Figure 8 Import source of fluorite with content of calcium fluoride >97% by weight in 2018 (Unit: 10,000 tons)

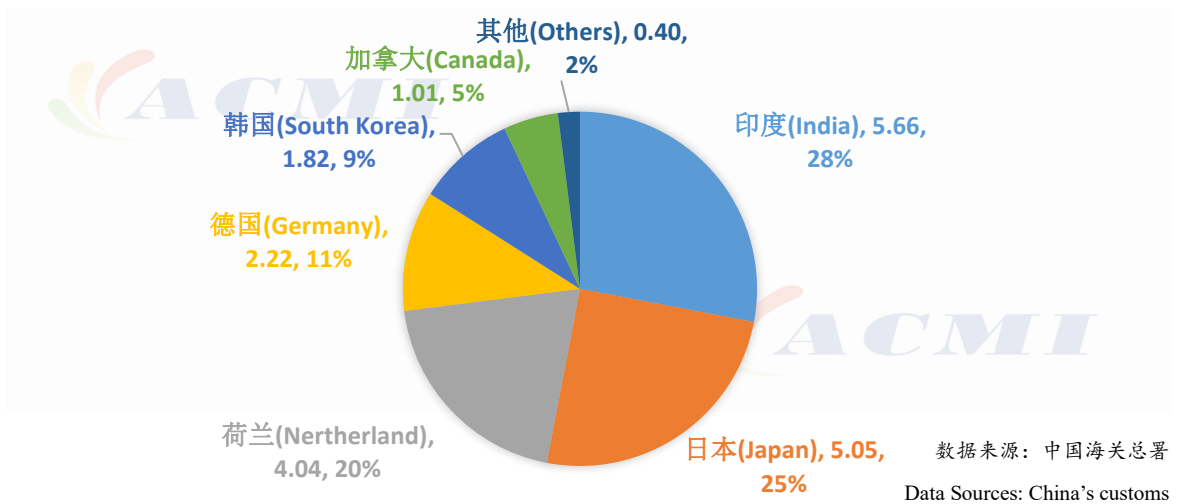


图9 2018年中国按重量计氟化钙含量>97%的萤石出口分布(单位:万吨)

Figure 9. Export destinations of fluorite with content of calcium fluoride >97% by weight in 2018 (Unit: 10,000 tons)

2.4 中国萤石供需平衡及市场预测

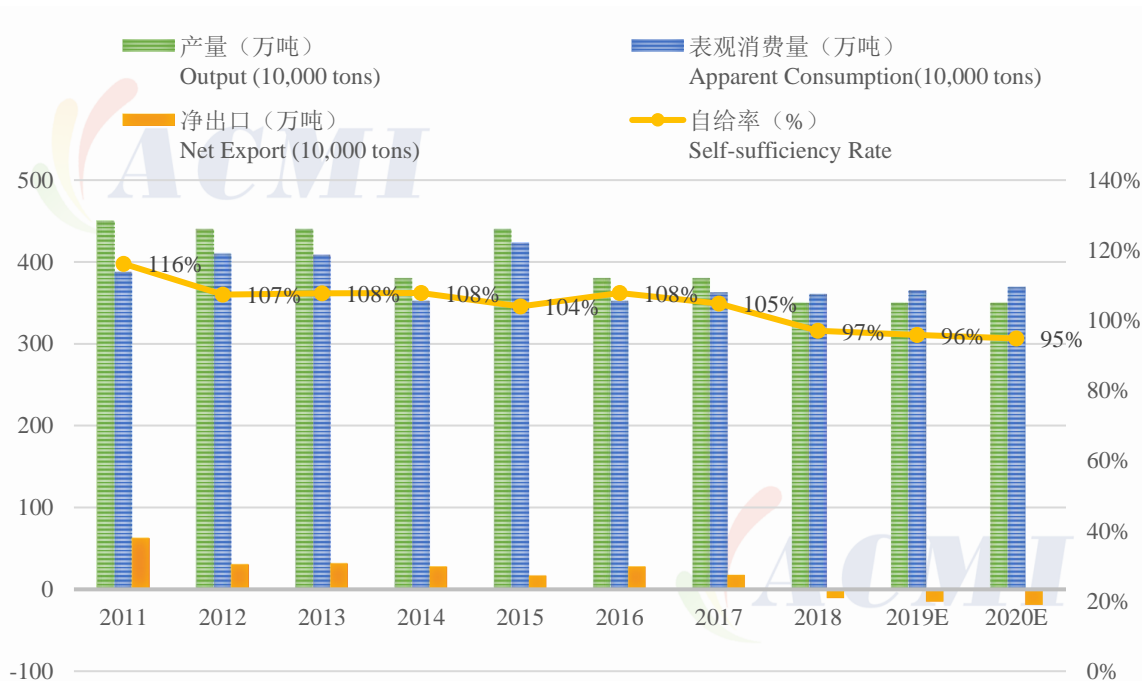
2.4 Supply and demand balance and market forecast of Chinese fluorite

2018 年，我国萤石产量为 350 万吨，净进口量为 11 万吨，表观消费量为 361 万吨。

In 2018, China's fluorite production was 3.5 million tons, net imports is 110,000 tons and apparent consumption was 3.61 million tons.

随着宏观政策对萤石管控趋严，近年来中国萤石产量保持稳中有降，净出口量持续下降，预计未来两年这一趋势将继续；考虑到未来两年将有大量氟化工产能释放，预计未来萤石消费量将有所增长。具体如图 10 所示。

With the tightening of macro policies on fluorite, China's fluorite production has maintained a steady decline in recent years, and the net export volume continues to decline, which is expected to continue in the next two years. Considering that a large amount of fluorine chemical production capacity will be released in China in the next two years, fluorite consumption is expected to increase in the future, as shown in figure 10.



数据来源：ACMI 整理

Data Source: ACMI

图 10 近年中国萤石供需平衡及预测

Figure 10. Supply and Demand Balance of Chinese Fluorite in recent years

第3章 无水氢氟酸行业

Chapter 3. Anhydrous Hydrofluoric Acid

无水氢氟酸是生产各种氟化合物的基本原料，是氟化工行业的咽喉要塞。我国的无水氢氟酸产能主要集中在浙江、福建、江苏、山东、江西、内蒙等地。河南、湖南的无水氢氟酸生产装置主要是为氟化铝配套。

Anhydrous hydrofluoric acid (AHF) is the basic raw material for the production of various fluorine compounds. China's AHF production capacity mainly distribute in Zhejiang province, Fujian province, Jiangsu Province, Shandong province, Jiangxi province and Inner Mongolia. AHF facilities in Henan and Hunan are mainly for aluminum fluoride.

3.1 中国无水氢氟酸生产现状

3.1 Production of Chinese AHF

2018年我国无水氟化氢的产能达到192.1万吨/年，实际生产量约158.8万吨。表3所示为2018年我国主要氟化氢生产厂家（产能大于5万吨/年）。

In 2018, the annual production capacity of AHF in China reached 1.921 million tons, and the actual production capacity was about 1.588 million tons. Table 3 shows the major AHF manufacturers in China in 2018.

表3 2018年我国主要氟化氢生产企业
Table 3. Major AHF manufacturers in China in 2018

公司名 Company	生产线 Number of Production Line	产能(万吨/年) Production Capacity (10,000 tons/year)	备注 Remarks
三美股份 Sanmei	7	15	自用为主 Mainly for self use
多氟多 Do Fluoride	4	8	自用为主 Mainly for self use

三爱富 3F	5	8	
巨化集团 Juhua	4	7	自用 Self use
东岳金峰 Dongyue Jinfeng	3	6	自用 Self use
福建高宝 Fujian Gaobao	3	6	部分自用 Partly self use
山东东岳 Shandong Dongyue	3	6	自用 Self use
邵武华新 Shaowu Huaxin	3	6	部分自用 Partly self use
邵武永飞 Shaowu Yongfei	3	6	部分自用 Partly self use
东沿药业 Dongyan Pharmaceutical	2	5	
江西石磊 Jiangxi Shilei	2	5	
西部矿业 West Mining	2	5	
江苏梅兰 Jiangsu Meilan	3	5	

数据来源：ACMI 整理

Data source: ACMI

3.2 中国无水氢氟酸消费分析

3.2 Consumption of Chinese AHF

2018年,中国无水氢氟酸的消费结构如图11所示,其中56%用于生产含氟制冷剂,24%用于生产含氟聚合物,8%用于生产含氟精细化工,6%用于生产无机氟产品。

In 2018, the consumption structure of AHF in China is shown in figure 11, in which 56% is used to produce fluorine-containing refrigerants, 24% is used to produce fluoropolymers, 8% is used to produce fluorine-containing fine chemicals, and 6% is used to produce inorganic fluorine products.

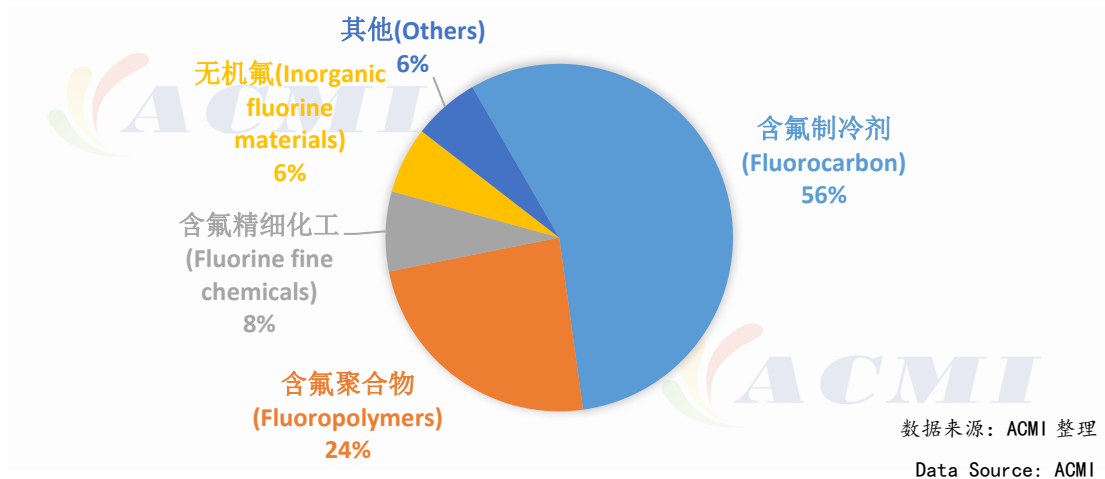


图 11 2018 年中国无水氟化氢消费结构
 Figure 11. Consumption structure of Chinese AHF in 2018

3.3 中国无水氢氟酸进出口贸易

3.3 Import and Export of Chinese AHF

中国是无水氢氟酸出口大国，出口数量远大于进口数量。图 12 所示为近 5 年中国无水氢氟酸进出口情况，可见净出口量整体呈上升趋势。

China is a major exporter of AHF, and the export quantity is much larger than the import quantity. Figure 11 shows the import and export of AHF in China in the past 5 years, and it can be seen that the overall net export volume shows an upward trend.

2018 年中国无水氢氟酸出口数量为 25.9 万吨，进口数量为 0.06 万吨，净出口量为 25.84 万吨。

In 2018, China exported 259,000 tons of AHF, imported 600 tons of AHF. The net exports of AHF was 258,400 tons.

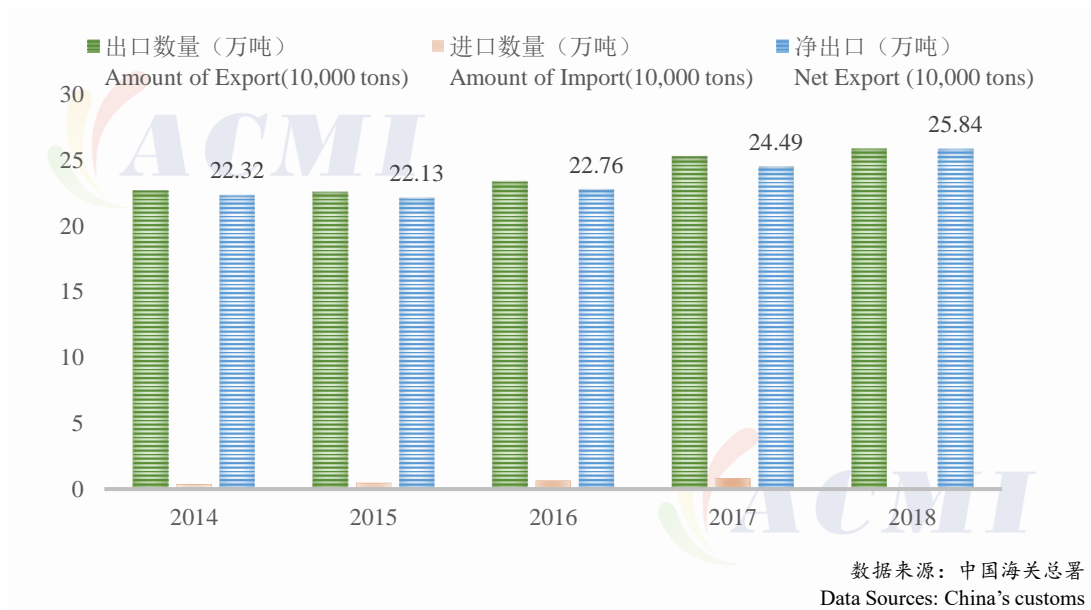


图 12 近 5 年中国无水氟化氢进出口情况
 Figure 12. Import and Export of Chinese AHF in recent 5 years

2018 年中国无水氢氟酸的主要出口地为日本、韩国、台澎金马关税区、马来西亚和泰国，具体情况如图 13 所示。

In 2018, the main export destinations of Chinese AHF are Japan, South Korea, The separate customs territory of Taiwan, Malaysia and Thailand, as shown in figure 13.

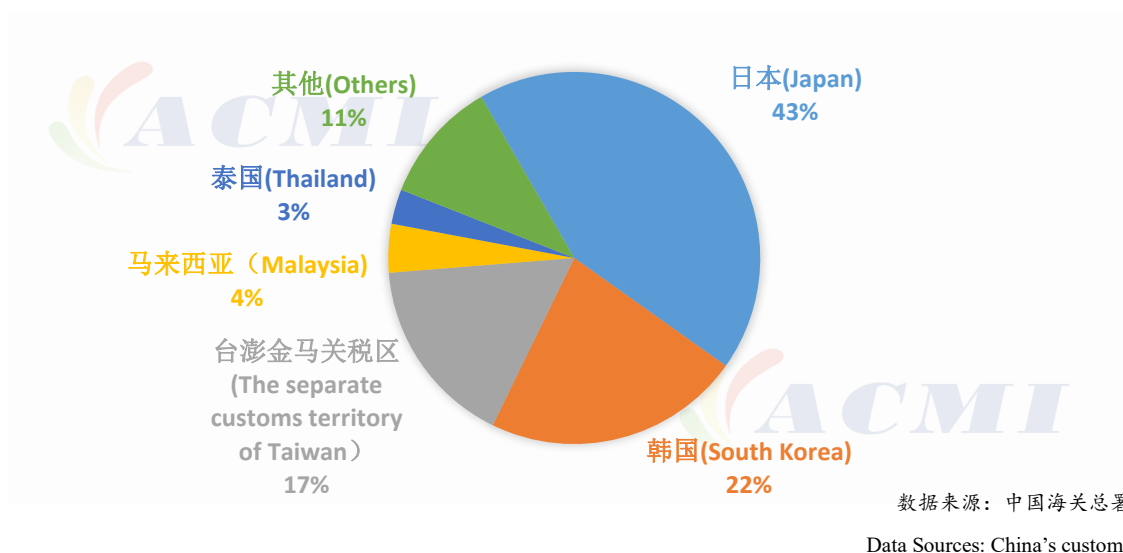


图 13 2018 年中国无水氟化氢出口分布
 Figure 13. Export destination of Chinese AHF in 2018

2018 年中国无水氢氟酸的主要进口来源包括：日本、台澎金马关税区和韩国，具体如图 14 所示。

The main import sources of AHF in China in 2018 include: Japan, The separate customs territory of Taiwan and South Korea, as shown in figure 14.

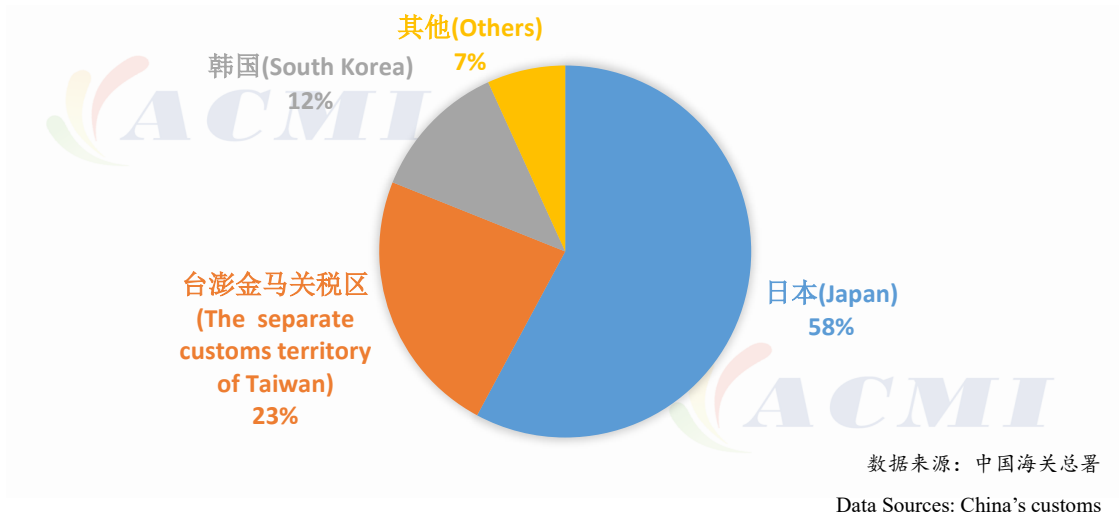


图 14 2018 年中国无水氟化氢进口来源
Figure 14. Import sources of AHF in 2018

3.4 中国无水氢氟酸供需平衡及市场预测

3.4 Supply and demand balance and market forecast of Chinese AHF

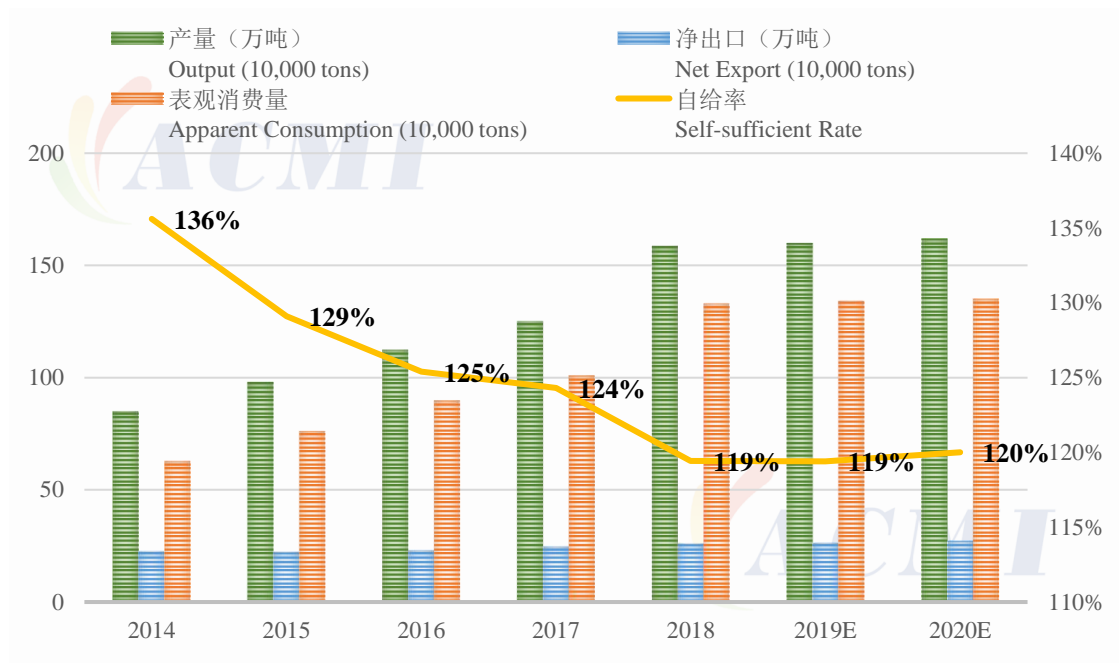
2018 年，我国无水氢氟酸产量为 158.8 万吨，净出口数量为 25.8 万吨，表观消费量为 133.0 万吨。

In 2018, China's AHF production was 1.588 million tons, net export quantity was 258,000 tons, and apparent consumption was 1.330 million tons.

氢氟酸是高危化学品，环保高压迫使无法承担环保费用的中小企业退出产能。随着近年政策管控趋严，氢氟酸准入门槛较高，预计未来两年氢氟酸产能基本维稳，不会出现明显增加。考虑到未来两年有新的氟化工产能释放，预计无水氢氟酸的需求量有少量增加。具体如

图 15 所示。

AHF is a high-risk chemical. Environmental pressure forced small and medium-sized enterprises who cannot afford the environmental fees out of the market. With the tightening of policy control in recent years, the entry threshold of AHF is relatively high. It is expected that the production capacity of AHF will be basically stable in the next two years. Considering there are lots of new fluorine chemical production capacity that will be released in the next two years, the demand for AHF is expected to increase slightly. Figure 15 shows the details.



数据来源：ACMI 整理

Data Source: ACMI

图 15 近年中国无水氢氟酸供需平衡及预测

Figure 15. Supply and Demand Balance of Chinese AHF in recent years

第 4 章 含氟制冷剂行业

Chapter 4. Fluorinated Refrigerants

4.1 含氟制冷剂概述

4.1 Overview of fluorinated refrigerants

随着环保法规日渐趋严，含氟制冷剂已经历了四代技术发展变革。目前国内应用较广泛的含氟制冷剂为第二代制冷剂（HCFC）和第三代制冷剂（HFC），表 4 所示为四代含氟制冷剂的具体情况：

With the increasingly stringent environmental regulations, fluorinated refrigerants have undergone four generations of technological change. At present, the widely used fluorinated refrigerants in China are the second generation refrigerants (HCFC) and the third generation refrigerants (HFC). Table 4 shows the overview of fluorinated refrigerants of different generations.

表 4 四代含氟制冷剂概述

Table 4. Overview of fluorinated refrigerants

含氟制冷剂 Generation	物质类型 Type	代表产品 Representative products	备注 Remarks
第一代 First generation	氯氟烃类 (CFC)	R11、R12、R113、R114、 R500	破坏臭氧层，全球范围内已淘汰并禁产 These products have been phased out and banned worldwide due to their ozone depletion effect.
第二代 Second generation	氢氯氟烃 (HCFC)	R22、R141b、R142b、 R123、R124	ODP 值较 CFC 更低，发达国家已经基本淘汰， 我国实行配额制度，逐渐减产 Lower ODP values than CFCs. They are already phased out in developed countries and are being phased out in developing countries.
第三代 Third generation	氢氟烃 (HFC)	R32、R125、R134a、 R410a、R152a、R143a、 R227ea、R236	ODP 值为 0，但 GWP 值较大。目前发达国家已经开始削减用量 Their ODP values are 0 with relatively large GWP values. The developed countries are phasing out them.

第四代
 Fourth generation 氢氟烯烃 (HFO) R1234yf、R1234ze

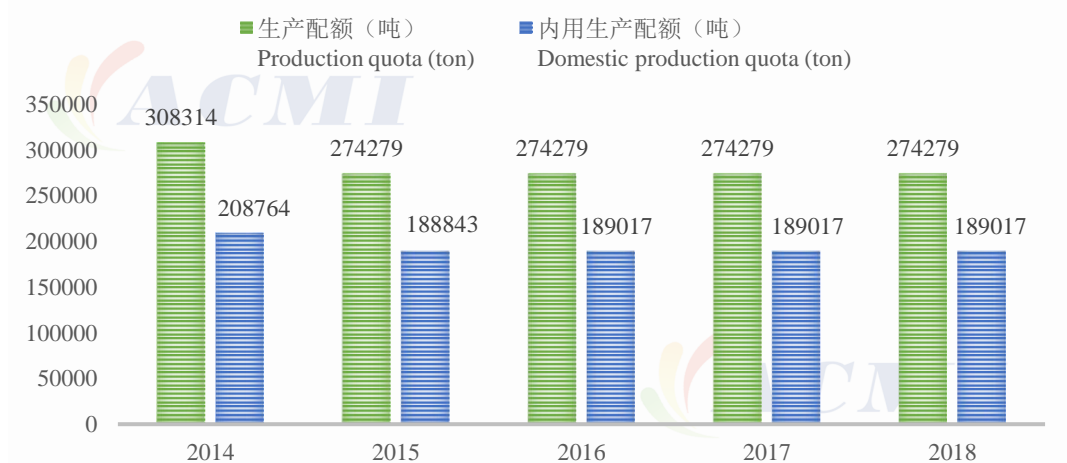
ODP 值为 0, 同时拥有极低的 GWP 值, 专利壁垒高, 制冷效果和安全性略逊于 HFC
 Their ODP values are 0, and GWP values are very low. But their patent barrier is very high, and their refrigeration effect and safety is slightly inferior to HFCs.

4.2 中国含氟制冷剂生产现状

4.2 Production of Chinese Fluorinated Refrigerants

我国从 2013 年开始对 HCFC 的生产和消费实施配额制, 并要求在 2020 年淘汰 35%HCFC 的生产和消费量。HCFC-22 是国内应用最广泛的第二代含氟制冷剂, 图 16 所示为近五年中国 HCFC-22 的生产配额情况。

China began to implement the quota system for the production and consumption of HCFC in 2013, and required to eliminate the production and consumption of 35%HCFC by 2020. HCFC-22 is the most widely used HCFCs, and Figure 16 shows the quota of HCFC-22 in recent five years.



数据来源: 生态环境部

Data sources: Ministry of Ecological Environment

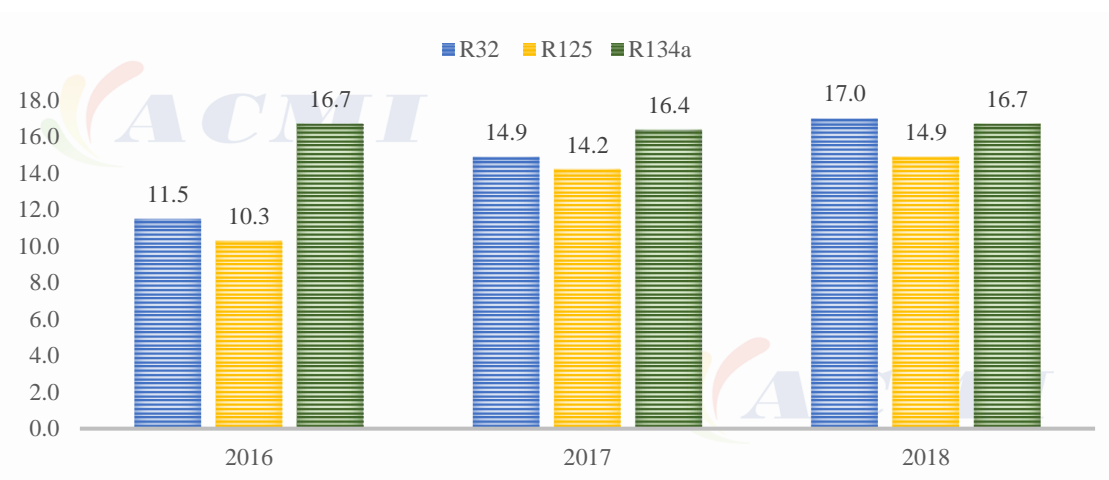
图 16 2014-2018 年中国 HCFC-22 生产配额

Figure 16. Quota of HCFC-22 in China in recent 5 years

2016 年 10 月, 《蒙特利尔议定书》第 28 次缔约方大会达成的基加利修正案确定了 HFC

的淘汰时间，中国将从 2024 年开始冻结 HFC 产能，2029 年开始实施削减 HFC。图 17 所示为近三年，中国 HFC 主要产品的产量。

In October 2016, the Kigali amendment agreed on the 28th conference of the parties to the Montreal protocol set the time for phasing out HFC. China will freeze HFC capacity from 2024 and cut it from 2029. Figure 17 shows the output of major HFC products in China in the past three years.



数据来源：中国氟硅有机材料工业协会(CAFSI)

Data source: China association of fluorine and silicon industry

图 17 2016-2018 年中国 HFC 主要产品产量 (万吨)

Figure 17. Output of major HFC products in China in recent years

2018 年，中国 HCFC-22 的生产企业共 15 家，总产能为 79 万吨/年；HFC-32 的生产企业共 13 家，总产能为 23.4 万吨/年；HFC-125 的生产企业共 11 家，总产能为 24.5 万吨/年，HFC-134a 的生产企业共 7 家，总产能为 23.0 万吨/年。

In 2018, there were 15 HCFC-22 manufacturers in China, with a total production capacity of 790,000 tons/year; 13 HFC-32 manufacturers with a total production capacity of 234,000 tons/year; 11 HFC-125 manufacturers with a total production capacity of 245,000 tons/year; 7 HFC-134a manufacturers with a total production capacity of 230,000 tons/year.

表 5 所示为我国主要含氟制冷剂生产企业。

Table 5 shows the major fluorinated refrigerant manufacturers in China.

表 5 中国含氟制冷剂主要生产企业

Table 5. Major fluorinated refrigerant manufacturers in China

公司名称/Company	主要产品/Major Products
东岳集团 Dongyue Group	HCFC-22、HCFC-142b、HFC-32、HFC-125、HFC-134a、HFC-143a、HFC-152a、 HFC-227ea
巨化股份 Juhua Group	HCFC-22、HCFC-141b、HCFC-142b、HFC-32、HFC-125、HFC-134a、HFC-143a、 HFC-236fa、HFC-245fa、HFO-1234yf
三美股份 Sanmei Group	HCFC-22、HCFC-141b、HCFC-142b、HFC-32、HFC-125、HFC-134a、HFC-143a
中化蓝天集团 SinoChem Lantian Group	HCFC-124、HCFC-123、HCFC-113a、HCFC-142b、HFC-32、HFC-125、HFC-134a、 HFC-143a、HFC-227ea、HFC-245fa、HFC-236fa
三爱富集团 3F Group	HCFC-141b、HCFC-22、HCFC-142b、HFC-32、HFC-152a、HFC-227ea、 HFO-1234yf、HFO-1336
梅兰集团 Meilan Group	HCFC-22、HFC-32、HFC-125、HFC-152a
永和集团 Yonghe Group	HCFC-22、HFC-32、HFC-125、HFC-152a、HFC-143a
山东华安新材料有限公司 Shandong Huaan New Materials Co.Ltd	HCFC-142b、HFC-32、HFC-125、HFC-134a、HFC-143a、HFC-152a

数据来源：ACMI 整理

Data source: ACMI

4.3 中国含氟制冷剂消费分析

4.3 Consumption of Chinese Fluorinated Refrigerants

目前中国正处于从 HCFC 制冷剂向 HFC 制冷剂过渡的阶段，主要消费行业包括：房间空调、冰箱冷柜、工商制冷、汽车空调、消防器材生产、发泡剂生产、气雾剂生产等七大类（含维修）。表 6 所示为七大应用领域的常用制冷剂。

Currently, China is in the stage of transition from HCFCs to HFCs, and the main consumer industries (including maintenance) of fluorinated refrigerants include: room air conditioner,

refrigerator, industrial and commercial refrigeration, automobile air conditioner, fire equipment production, foaming agent production, aerosol production and so on. Table 6 shows the commonly used refrigerants in seven major application areas.

表 6 中国常见含氟制冷剂应用领域
Table 6. The major application of fluorinated refrigerants

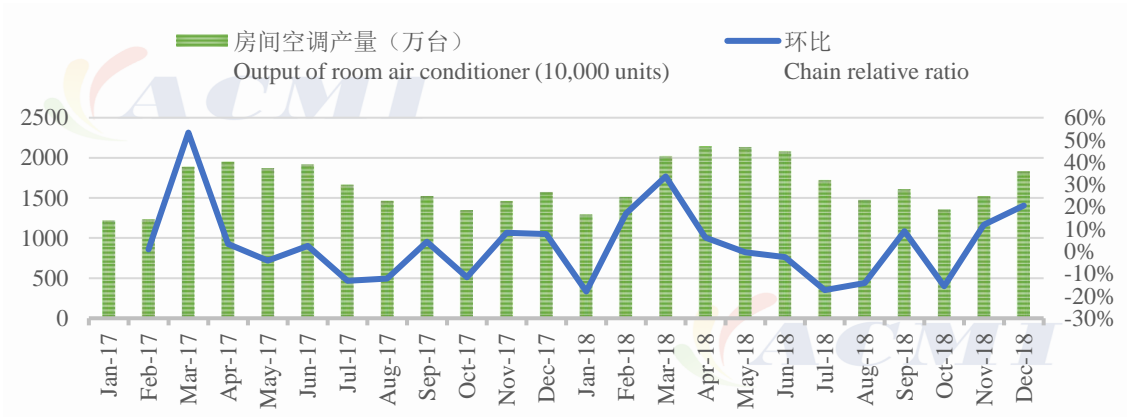
应用领域 Applications	制冷剂产品 Representative Products
房间空调 Room air conditioner	HCFC-22、HCFC-142b、HFC-32、HFC-125、HFC-134a、HFC-410a 等
汽车空调 Automotive air conditioner	HFC-134a、HFO-1234yf
工商制冷 Industrial and commercial refrigeration	HCFC-22、HCFC-123、HFC-404a、HFC-134a、HFC-125、HFC-32、HFC-143a
消防器材 Fire equipment	HFC-227ea、HFC-236fa
发泡剂 Foaming agent	HCFC-141b、HFC-134a 、HFC-245fa、HFO-1234ze
气雾剂 Aerosol	HFC-134a、HFC-152a、HFC-227ea
冰箱冰柜 Refrigerator	HFC-134a

数据来源：ACMI 整理

Data source: ACMI

近年来，制冷剂下游应用领域行情稳定，尤其是宏观政策积极推行新能源汽车，有望带动汽车用制冷剂的升级换代。图 18-20 所示为近两年主要下游应用行业产量情况。

In recent years, the downstream application field of refrigerants is stable, especially the macro policy actively promotes new energy vehicles, which is expected to drive the upgrading of automotive refrigerants. Figure 18-20 shows the output of major downstream application industries in the past two years.

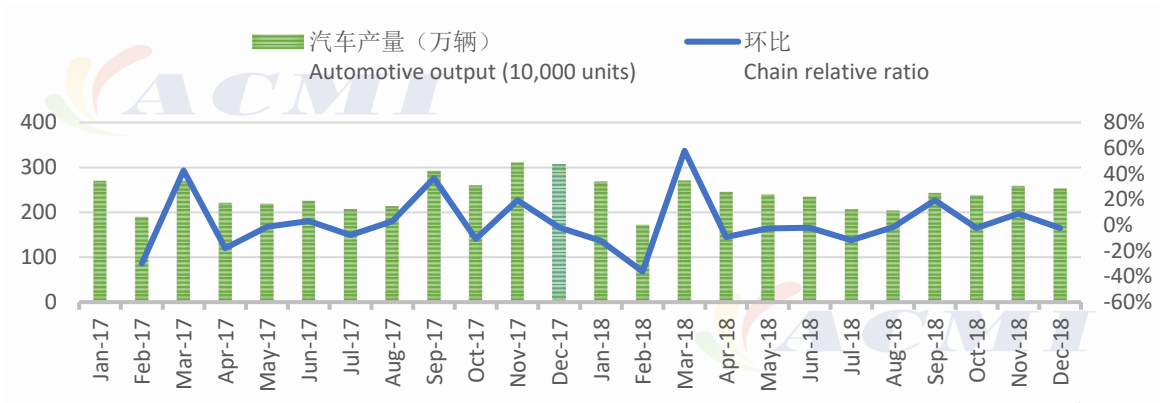


数据来源：国家统计局

图 18 2017-2018 年中国房间空调产量

Data source: State statistics bureau

Figure 18. Output of Chinese room air conditioner in 2017-2018

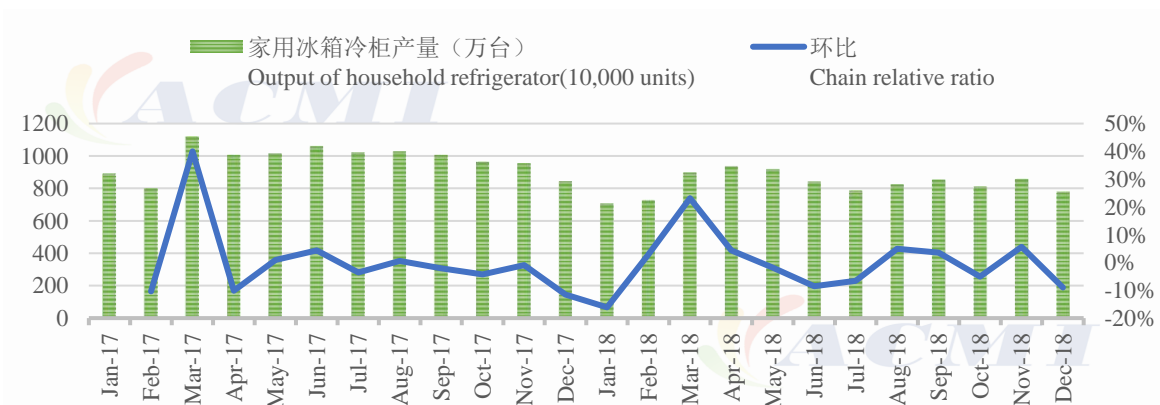


数据来源：国家统计局

图 19 2017-2018 年中国汽车产量

Data source: State statistics bureau

Figure 19. Output of Chinese automotive in 2017-2018



数据来源：国家统计局

图 20 2017-2018 年中国家用冰箱冷柜产量

Data source: State statistics bureau

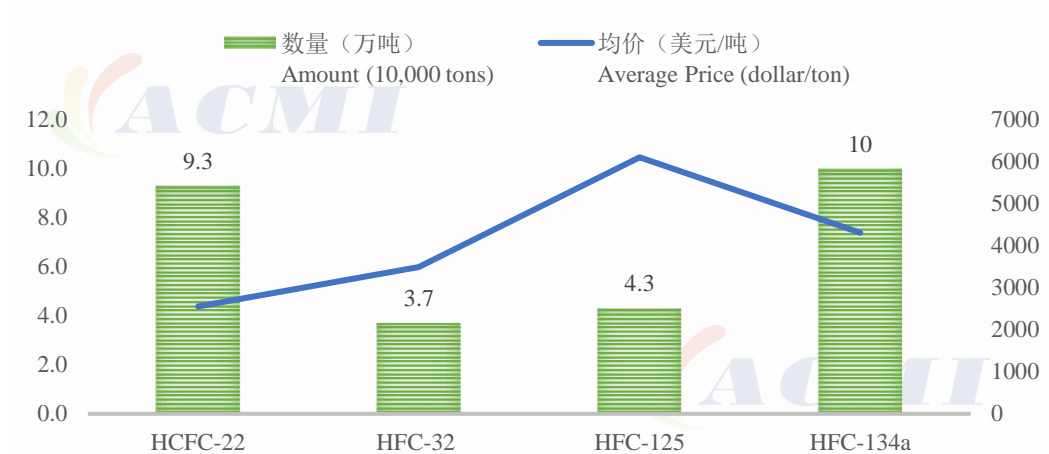
Figure 20. Output of Chinese household refrigerator in 2017-2018

4.4 中国含氟制冷剂进出口贸易

4.4 Import and Export of Chinese Fluorinated Refrigerants

全球有超过一半的含氟制冷剂产能坐落在中国。在国际贸易方面，中国是含氟制冷剂的出口大国，进口量非常小。图 21 所示为 2018 年，中国主要含氟制冷剂出口数量。

More than half of the world's fluorinated refrigerant production capacity locates in China. In terms of international trade, China is a major exporter of fluorinated refrigerants and nearly imports them. Figure 21 shows the amount of import and export of major fluorinated refrigerants in China in 2018.



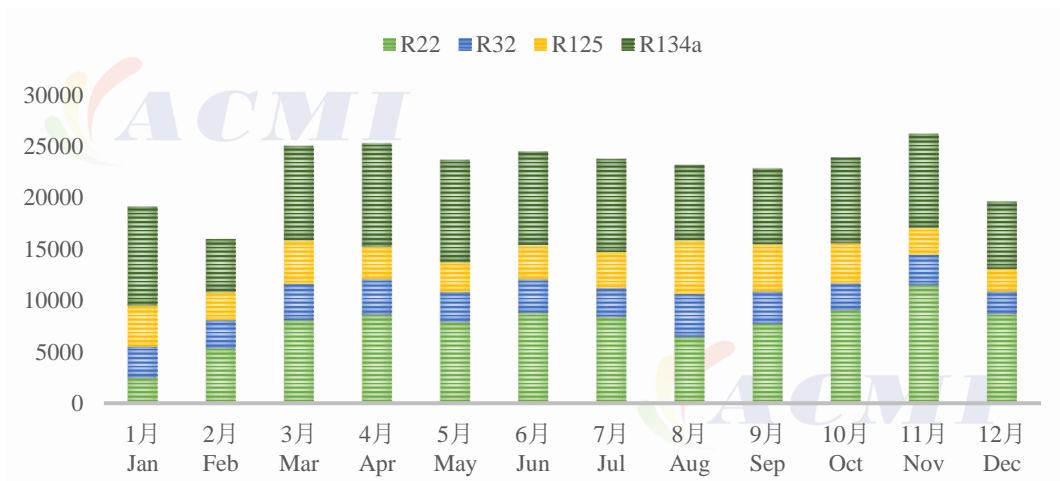
数据来源：中国海关总署
Data Sources: China's customs

图 21 2018 年中国主要含氟制冷剂出口数量及均价

Figure 21. major Chinese fluorinated refrigerant export quantity and average price in 2018

图 22 所示为中国主要含氟制冷剂月度出口数量。

Figure 22 shows the monthly export volume of major fluorinated refrigerants in China in 2018.



数据来源：中国海关总署

Data Sources: China's customs

图 22 2018 年中国主要含氟制冷剂月度出口数量 (吨)

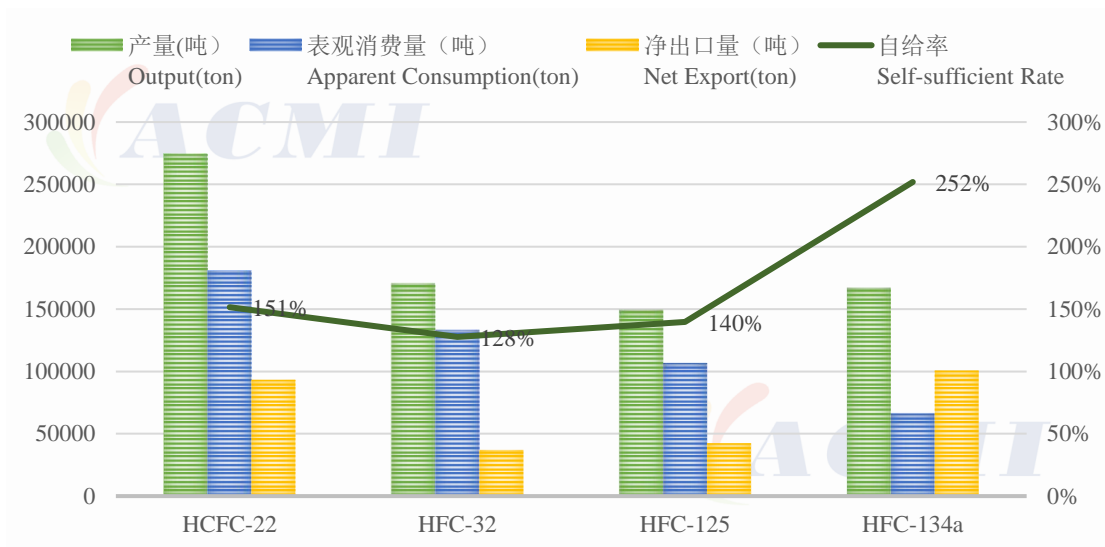
Figure 22. Monthly export quantity of major Chinese fluorinated refrigerant

4.5 中国含氟制冷剂供需平衡

4.5 Supply and demand balance and market forecast of Chinese Fluorinated Refrigerants

2018年,我国主要含氟制冷剂的供需情况如图 23 所示,其中 HCFC-22 的自给率为 151%, HFC-32 的自给率为 128%, HFC-125 的自给率为 140%, HFC-134a 的自给率为 252%。可见用于出口的制冷剂数量在总产量中所占比例较大,这意味着我国含氟制冷剂受国际环境变化的影响非常大。

In 2018, the supply and demand of major fluorine-containing refrigerants in China is shown in figure 23. The self-sufficiency rate of HCFC-22, HFC-32, HFC-125 and HFC-134a is 151%, 128%, 140% and 252% respectively. The amount of fluorinated refrigerants that used for export accounts for a large proportion in the total output, which means Chinese fluorinated refrigerants industry can be greatly affected by international environmental changes.



数据来源：ACMI 整理

Data source: ACMI

图 23 2018 年中国主要含氟制冷剂供需平衡情况

Figure 23. Supply and Demand Balance of Chinese major fluorinated refrigerants in recent years

第 5 章 含氟聚合物行业

Chapter 5. Fluoropolymers

5.1 含氟聚合物概述

5.1 Overview of Chinese fluoropolymers

含氟聚合物一般是指具有部分或全部 C-H 键被 C-F 键取代的有机聚合物。在我国含氟聚合物领域，用量最大的是聚四氟乙烯 (PTFE)，其次为聚偏氟乙烯 (PVDF)、聚全氟乙丙烯 (FEP) 和氟橡胶 (FKM)，本报告将重点介绍这四种聚合物。

Fluoropolymers generally refer to organic polymers with some or all C-H bonds replaced by C-F bonds. In China, the top four consumable fluoropolymers are PTFE, PVDF, FEP and FKM. Our report will focus on these four polymers.

此外，PFA、ETFE 等聚合物的用量虽然少，但都属于含氟聚合物领域的高端品种，在某些领域具有不可替代的作用。

Although the consumption of PFA and ETFE is relatively small, they all belong to the high-end varieties in the field of fluoropolymers, and they are irreplaceable in certain fields.

图 24 所示为我国含氟聚合物产能分布，其中 82% 的含氟聚合物产能分布在华东地区。

Figure 24 shows the distribution of fluoropolymer production capacity in China, among which 82% is distributed in east China.

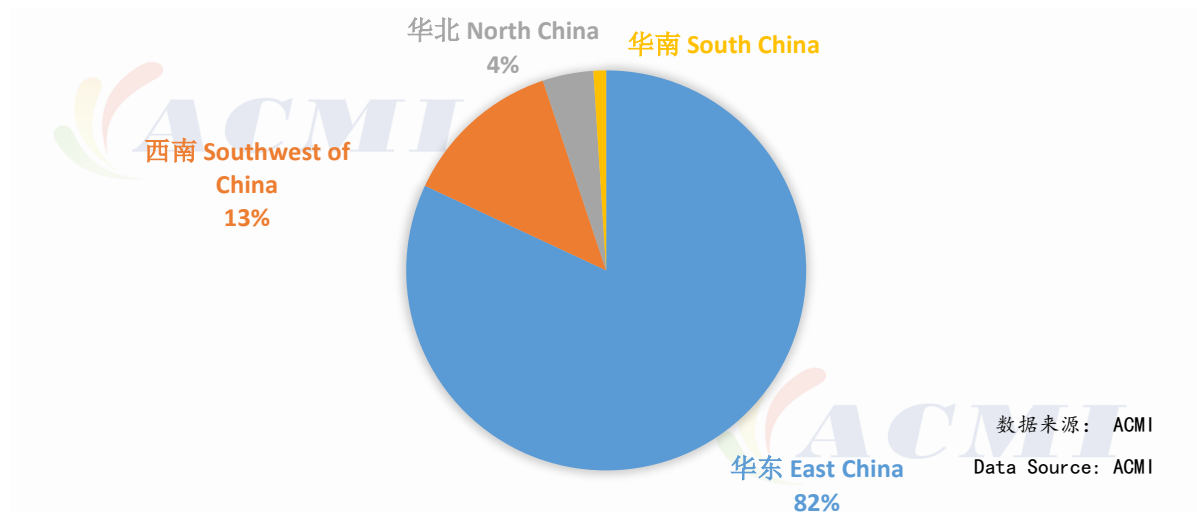


图 24 中国含氟聚合物产能分布

Figure 24. Distribution of Chinese production capacity of fluoropolymers

5.2 中国含氟聚合物生产现状

5.2 Production of Chinese Fluoropolymers

2018 年，中国主要的 PTFE 生产企业有 12 家，主要分布在华东地区，产能合计约 13.78 万吨/年，平均开工率 79.7%。表 7 所示为 2018 年中国主要 PTFE 生产企业。

By the end of 2018, there were 12 major PTFE manufacturers in China, mainly distributed in east China, with a total capacity of about 137,800 tons/year and an average operating rate of 79.7%. Table 7 shows these major PTFE manufacturers.

表 7 中国主要 PTFE 生产企业
Table 7. Major PTFE manufacturers in China

序号/No.	企业名称/Company name
1	东岳集团 Dongyue Group
2	中昊晨光化工研究院有限公司 Zhonghao Chenguang Research Institute of Chemical Industry Co.,Ltd
3	巨化集团 Juhua Group
4	常熟三爱富氟源新材料有限公司 Changshu 3F Fuyuan New materials Co.Ltd
5	江苏梅兰化工有限公司 Jiangsu Meilan Chemical Co.Ltd
6	江西理文化工有限公司 Lee & Man Chemical Co.,Ltd
7	大金氟化工（中国）有限公司 Daikin Fluorochemicals (China) Co.Ltd
8	福建三农新材料有限责任公司 Fujian Sannong new materials Co.,Ltd
9	山东华氟化工有限公司 Shandong Fluorine Chemical Co.Ltd
10	科慕（常熟）氟化物科技有限公司 Chemours(Changshu) fluorochemical technology Co.,Ltd
11	浙江永和制冷股份有限公司 Zhejiang Yonghe Refrigerant Co.Ltd
12	鲁西集团 Luxi Group

数据来源：ACMI 整理

Data source: ACMI

2018 年，我国主要的 PVDF 生产企业有 11 家，产能合计 5.85 万吨/年，主要分布在华东地区，平均开工率为 66.56%。表 8 所示为 2018 年中国主要 PVDF 生产企业。

By the end of 2018, there were 11 major PVDF manufacturers in China, with a total capacity of about 58,500 tons/year and an average operating rate of 66.56%. Table 8 shows these major PTFE manufacturers.

表 8 中国主要 PVDF 生产企业
Table 8. Major PVDF manufacturers in China

序号/No.	企业名称/Company name
1	阿科玛(常熟)氟化工有限公司 Arkema(Changshu) Fluorochemical Co.Ltd
2	东岳集团 Dongyue Group
3	苏威特种聚合物(常熟)有限公司 Solvay Specialty Polymers(Changshu) Co.,Ltd
4	内蒙古三爱富万豪氟化工有限公司 Inner Mongolia 3F Wanhao Fluorochemical Co.,Ltd
5	山东德宜新材料有限公司 Shandong Deyi New Materials Co.,Ltd
6	吴羽(常熟)氟材料有限公司 Kureha(Changshu) Fluoropolymers Co.Ltd
7	浙江孚诺林化工新材料有限公司 Zhejiang fluorine chemical new materials co., Ltd
8	巨化集团 Juhua Group
9	乳源东阳光氟树脂有限公司 Ruyuan Dongyangguang fluoropolymers Co.Ltd
10	中化蓝天集团 SinoChem Lantian Group
11	河北龙星化工股份有限公司 Longxing Chemical Stock Co, Ltd

数据来源: ACMI 整理

Data source: ACMI

2018 年, 我国主要的 FEP 生产企业有 9 家, 产能合计 2.56 万吨/年, 主要分布在华东地区, 其次是西南地区, 平均开工率为 62.19%。表 9 所示为 2018 年中国主要 FEP 生产企业。

By the end of 2018, there were 9 major FEP manufacturers in China, mainly distributed in east China and southwest China, with a total capacity of about 25,600 tons/year and an average operating rate of 62.19%. Table 9 shows these major FEP manufacturers.

表 9 中国主要 FEP 生产企业
Table 9. Major FEP manufacturers in China

序号/No.	企业名称/Company name
1	东岳集团 Dongyue Group
2	大金氟化工（中国）有限公司 Daikin Fluorochemicals (China) Co.Ltd
3	浙江永和制冷股份有限公司 Zhejiang Yonghe Refrigerant Co.Ltd
4	巨化集团 Juhua Group
5	江苏梅兰化工有限公司 Jiangsu Meilan Chemical Co.Ltd
6	重庆新氟科技有限公司 Chongqing Xinfu Technology Co.Ltd
7	鲁西集团 Luxi Group

数据来源：ACMI 整理

Data source: ACMI

2018 年，我国主要的 FKM 生产企业有 8 家，产能合计 2.37 万吨/年，主要分布在华东地区，其次是西南地区，平均开工率为 67.67%。表 10 所示为 2018 年中国主要 FKM 生产企业。

By the end of 2018, there were 8 major FKM manufacturers in China, mainly distributed in east China, followed by southwest China, with a total capacity of about 23,700 tons/year and an average operating rate of 67.67%. Table 10 shows these major FKM manufacturers.

表 10 中国主要 FKM 生产企业
Table 10. Major FKM manufacturers in China

序号/No.	企业名称/Company name
1	晨光科慕氟材料（上海）有限公司 The Chemours Chenguang Fluoromaterials (Shanghai) Co., Ltd
2	东岳集团 Dongyue Group

3	内蒙古三爱富万豪氟化工有限公司 Inner Mongolia 3F Wanhao Fluorochemical Co.,Ltd
4	大金（氟化工）中国有限公司 Daikin Fluorochemicals (China) Co.Ltd
5	江苏梅兰化工集团有限公司 Jiangsu Meilan Chemical Co.Ltd
6	苏威特种聚合物（常熟）有限公司 Solvay Specialty Polymers(Changshu) Co.,Ltd
7	中昊晨光化工研究院有限公司 Zhonghao Chenguang Research Institute of Chemical Industry Co., Ltd

数据来源：ACMI 整理

Data source: ACMI

5.3 中国含氟聚合物消费分析

5.3 Consumption of Chinese Fluoropolymers

2018 年，中国四大含氟聚合物广泛应用于涂料工业、锂电应用、电线电缆、汽车工业、航空航天等领域。图 25-28 分别是 2018 年 PTFE、PVDF、FEP 和 FKM 的消费结构。

In 2018, China's four major fluoropolymers were mainly used in coating industry, lithium electric industry, wires and cables, automobile industry, aerospace and other fields. Figure 25-28 show the consumption structure of PTFE, PVDF, FEP and FKM, respectively.

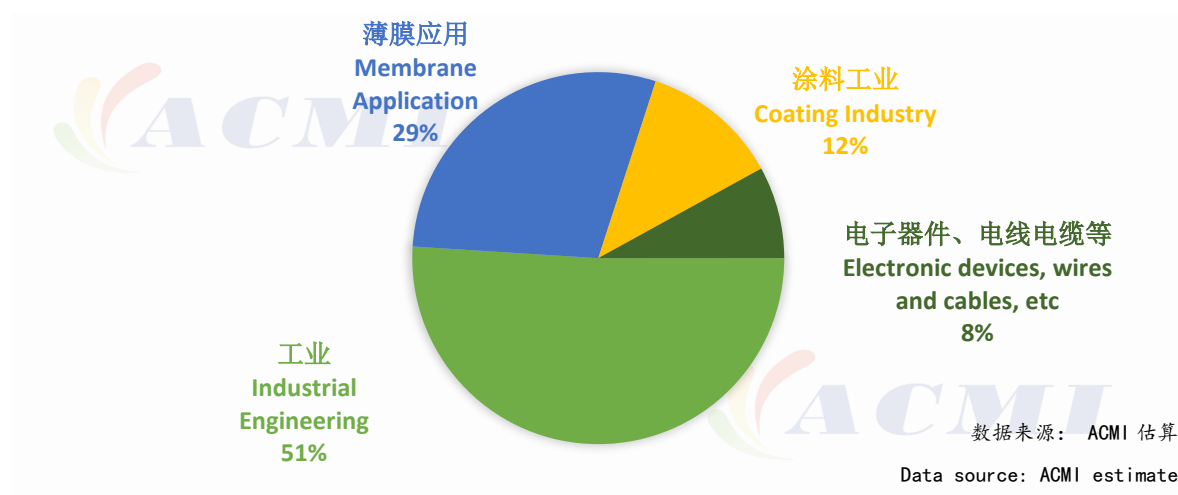


图 25 2018 年中国 PTFE 消费结构
Figure 25 Consumption structure of Chinese PTFE in 2018

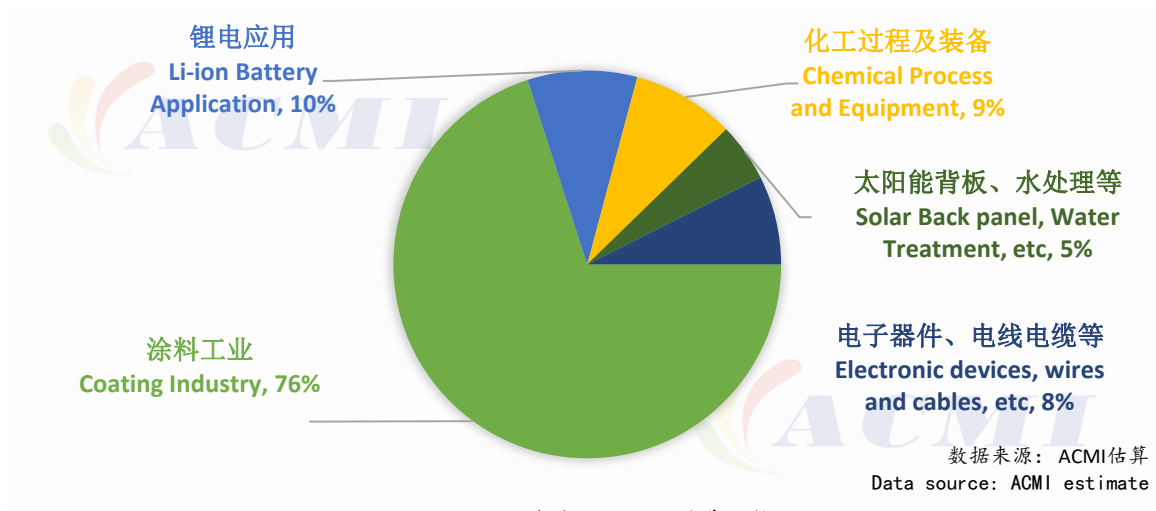


图 26 2018 年中国 PVDF 消费结构

Figure 26. Consumption structure of Chinese PVDF in 2018

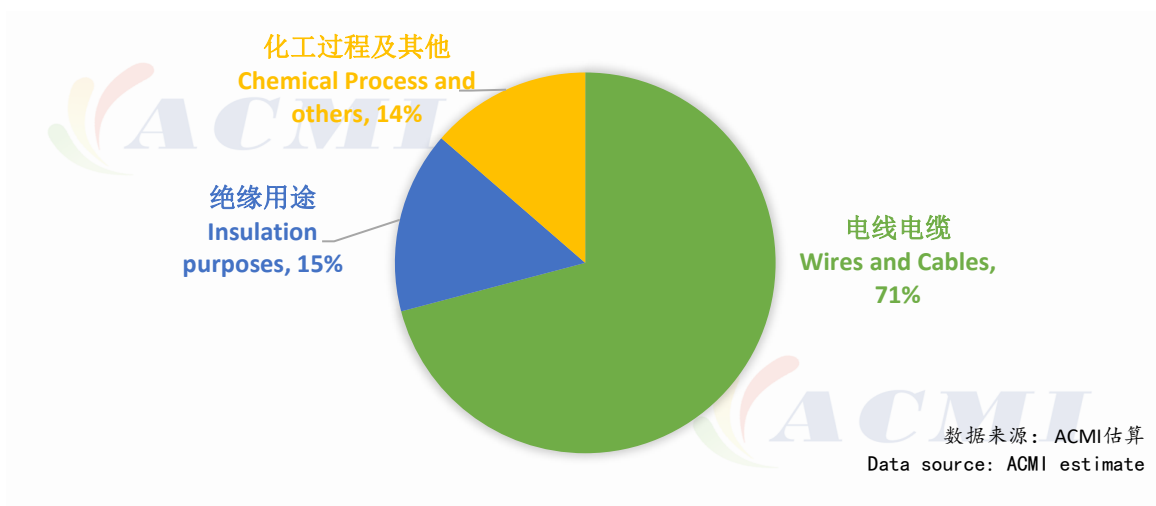


图 27 2018 年中国 FEP 消费结构

Figure 27. Consumption structure of Chinese FEP in 2018

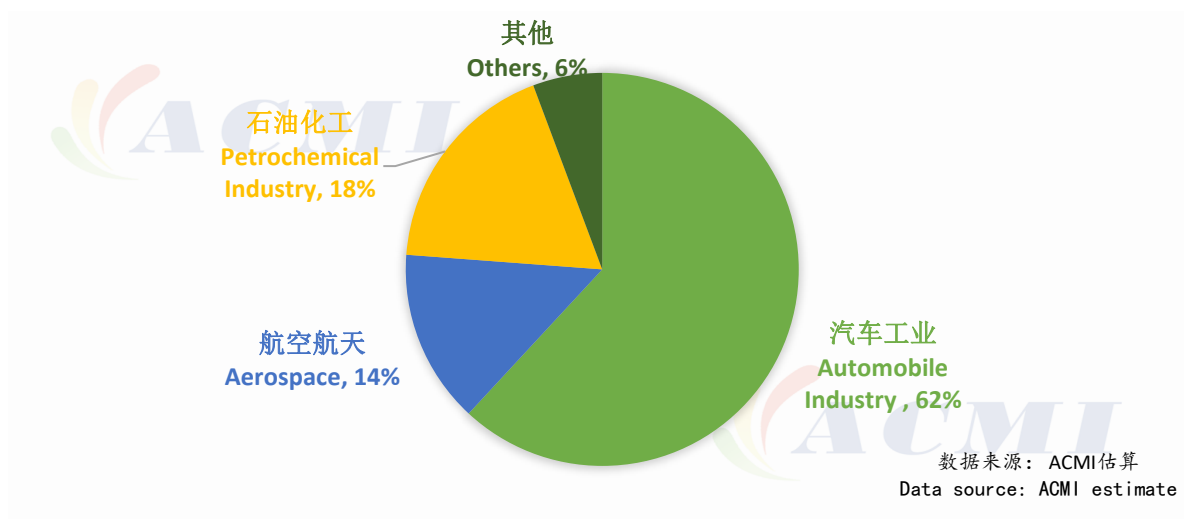


图 28 2018 年中国 FKM 消费结构
 Figure 28. Consumption structure of Chinese FKM in 2018

5.4 中国含氟聚合物进出口贸易

5.4 Import and export of Chinese Fluoropolymers

中国海关的统计数据中，含氟聚合物主要分列在 39046100（初级形状的聚四氟乙烯）和 39046900（其他初级形状的氟聚合物）两个税号下。2018 年，以上两个税号中氟聚合物双向贸易共约 4095 笔，净出口数量约 2.86 万吨，如图 29 所示。

According to the statistics of China customs, fluoropolymers are mainly listed under the tax codes 39046100 (PTFE in primary form) and 39046900 (other fluoropolymers in primary form). In 2018, there were about 4,095 two-way trade transactions of fluoropolymers in the above two tax codes, with a net export volume of about 28,600 tons, as shown in figure 29.

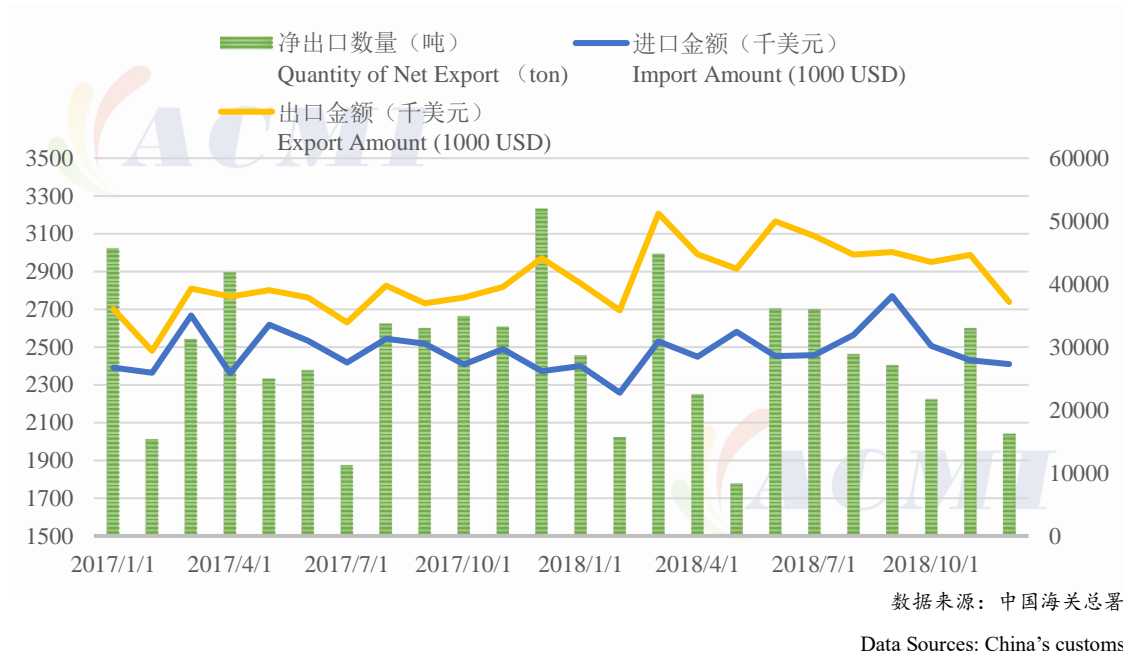


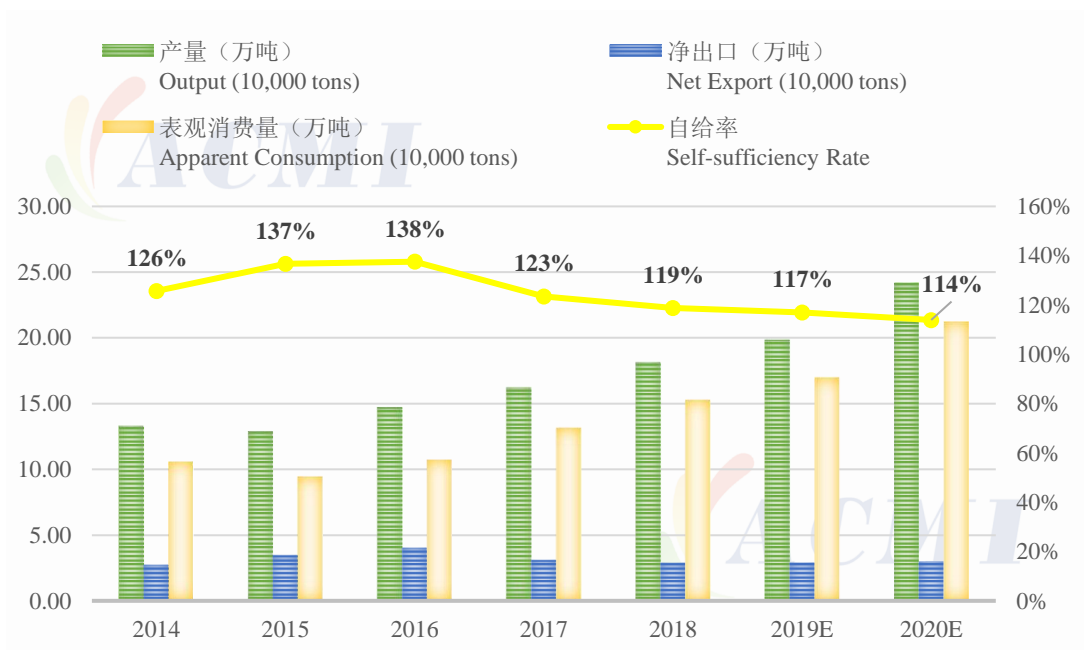
图 29 2017-2018 年中国初级形状含氟聚合物净出口数量及进出口金额
 Figure 29. Import and Export of Chinese fluoropolymers in primary form in 2018

5.5 中国含氟聚合物供需平衡及市场预测

5.5 Supply and demand balance and market forecast of Chinese fluoropolymers

2018 年，中国含氟聚合物产量约为 18.13 万吨，净出口量为 2.86 万吨，表观消费量为 15.27 万吨，自给率为 114%，具体如图 30 所示。

In 2018, the production of fluoropolymers in China was about 181,300 tons, the net export quantity was 28,600 tons, the apparent consumption was 152,700 tons, and the self-sufficiency rate was 114%, as shown in figure 30.



数据来源：ACMI 估算

图 30 近年中国含氟聚合物供需平衡及预测 Data source: ACMI estimate

Figure 30. Supply and demand balance of Chinese fluoropolymers in recent years

2010 年至今，国内含氟聚合物的表观消费量增长具有周期性。结合近年来的新建产能数量，可以看出 2016~2017 年，国内含氟聚合物的需求较大。值得注意的是，未来两年国内仍有大量含氟聚合物产能投产，为了保持供需平衡，未来消费仍需要稳定增长。一旦消费需求扩张速度偏低，则很有可能会产生产能过剩的情况。

Since 2010, the apparent consumption growth of fluoropolymers in China is cyclical. Combined with the amount of new capacity built in recent years, it can be seen that the domestic demand for fluoropolymers is grow rapidly from 2016 to 2017. It is worth noting that there will still be a large amount of new fluoropolymer production capacity in the next two years. In order to maintain the balance between supply and demand, future consumption still needs to increase steadily, otherwise, there will be excess capacity.

第 6 章 含氟精细化学品行业

Chapter 6. Fluorine Fine Chemicals

含氟精细化学品,即对于基本氟化工生产的初级或次级化学品经过深加工而制取的具有特定用途、技术密集、附加值高、小批量生产的系列含氟产品,主要属于含氟中间体,可被应用于含氟医药、含氟农药和电子化学品。

Fluorine fine chemicals refer to the series of fluorine-containing products with specific usage, intensive technology, high value-added and small batch production for primary or secondary fluorine-containing chemical products after deep processing. They are mainly fluorine-containing intermediates and can be applied to fluorine-containing medicines, fluorine-containing pesticides and fluorine-containing electronic chemicals.

(1) 含氟医药 / Fluorine-containing medicines

目前,氟喹诺酮类药物是含氟医药领域的主要产品,鉴于其具备广谱抗药性、毒副作用小、给药方便等特点,成为我国含氟医药的研究重点,也是发展速度较快的抗感染类药物之一。

At present, fluoroquinolones are the main products in the field of fluorine-containing medicine. Due to its characteristics of broad spectrum resistance, small side effects and convenient administration, fluoroquinolones have become the focus of research in fluorocontaining medicine in China, and are also one of the anti-infection drugs with rapid development.

目前,我国已成为主要的氟喹诺酮类药物生产国和供应国之一,主要品种有:诺氟沙星、环丙沙星、氧氟沙星、左旋氧氟沙星、加替沙星、莫西沙星等。其中诺氟沙星、环丙沙星、氧氟沙星和左旋氧氟沙星产量较大,约占国内氟喹诺酮类抗感染类药物市场的九成以上。

China has become one of the main producers and suppliers of fluoroquinolones, the main varieties are: norfloxacin, ciprofloxacin, ofloxacin, levofloxacin, gatifloxacin, moxifloxacin and so

on. The output of norfloxacin, ciprofloxacin, ofloxacin and levofloxacin is relatively large, accounting for more than 90% of the domestic market of Afloqualone anti-infection drugs.

(2) 含氟农药/ Fluorine-containing pesticide

用氟原子和含氟基团替代农药芳环上的其他基团, 能够显著提高农药活性。80 年代后, 含氟农药的高效低毒特点使含氟农药市场的得到迅猛发展, 含氟农药现已成为世界农药工业发展的重点之一。我国自 20 世纪 70 年代开始含氟农药的研发, 现已形成拟除虫菊酯和苯甲酰胺两大类杀虫剂。

Using fluorine atoms and fluorine-containing groups to replace other groups on the aromatic ring of pesticides can significantly improve the activity of pesticides. Since the 1980s, the high efficiency and low toxicity of fluorine-containing pesticides have led to the rapid development of fluorine-containing pesticides market. Fluorine-containing pesticides have become one of the key points in the development of the world's pesticide industry. China began to develop fluorine-containing pesticides in the 1970s, and China has formed two types of insecticides, pyrethroids and benzoyl urea.

(3) 含氟电子化学品/ Fluorine-containing electronic chemicals

含氟电子化学品是在电子化学品中引入氟原子, 以提升化学品的电化学性能而形成的一类新型电子化学品。我国含氟电子化学品已广泛应用于太阳能、液晶面板、集成电路等相关行业产品, 尤其在高档电子产品中对提升电子元器件性能具有重要作用。

Fluorine-containing electronic chemicals are a new type of electronic chemicals formed by introducing fluorine atoms into electronic chemicals to improve their electrochemical properties. Fluorine-containing electronic chemicals have been widely used in solar energy, liquid crystal panels, integrated circuits and other related products, especially in high-end electronic products to improve the performance of electronic components.

2018 年, 我国含氟精细化学品总生产能力约为 23 万吨/年, 总产量约为 12 万吨, 产值约为 207 亿元。

In 2018, China's total production capacity of fluorine-containing fine chemicals was about 230,000 tons/year, with a total output of 120,000 tons and an output value of about 20.7 billion yuan.

第 7 章 相关政策法规

Chapter 7. Related policies

表 11 2018 年氟化工行业相关政策

Table 11 Fluorochemical industry related policies in 2018

发布时间 Release Time	文件 File	主要内容 Main point
2018 年 2 月 Feb 2018	《关于生产和使用消耗臭氧层物质建设项目管理有关工作的通知》 Notice on the Management of Construction Projects for the Production and Use of Ozone-depleting Substances	禁止新建、扩建生产和使用作为制冷剂、发泡剂、灭火剂、溶剂、清洗剂、加工助剂、气雾剂、土壤熏蒸剂等受控用途的消耗臭氧层物质的建设项目 It is prohibited to build, expand, produce and use ozone-depleting substances for controlled uses such as refrigerants, foaming agents, fire extinguishers, solvents, cleaning agents, processing aids, aerosols and soil fumigants.
2018 年 10 月 Oct 2018	《关于禁止生产以一氟二氯乙烷 (HCFC-141b) 为发泡剂的冰箱冷柜产品、冷藏集装箱产品、电热水器产品的公告》 Notice on the prohibition of the production of refrigerated refrigerator products, refrigerated container products and electric water heater products using HCFC-141b as foaming agent	自 2019 年 1 月 1 日起, 任何企业不得使用一氟二氯乙烷 (HCFC-141b) 为发泡剂生产冰箱冷柜产品、冷藏集装箱产品、电热水器产品。 From January 1 st , 2019, no enterprise shall use hfc-141b to produce refrigerator products, refrigerated container products and electric water heater products for foaming agent.
2018 年 11 月 Nov 2018	《战略性新兴产业分类 (2018)》 Classification of strategic emerging industries (2018)	新版本增加了合成氟树脂制造、氟制冷剂制造、其他含氟烷烃制造和氟硅合成橡胶制造等含氟材料。 The new version added synthetic fluorine resin manufacture, fluorine refrigerant manufacture, other containing fluorine alkane manufacture and fluorine silicon synthetic rubber manufacture and other containing fluorine material.
2018 年 12 月 Dec 2018	《市场准入负面清单草案 (2018 年版)》 Draft negative list for market access (2018 edition)	新建、改建、扩建第四类监控化学品中含磷、硫、氟的特定有机化学品需要生产特别许可、设施建设审批和竣工验收 Specific organic chemicals containing phosphorus, sulfur and fluorine in category iv MCCS that are newly built, rebuilt or expanded shall require special permission for production, approval of facility construction and completion acceptance."

数据来源: ACMI 整理

Data Source: ACMI

第 8 章 2018 年氟化工行业大事记

Chapter 8. Events Calender

2018 年 1 月，生态环境部发布《关于生产和使用消耗臭氧层物质建设项目管理有关工作的通知》，宣布禁止新建、扩建生产和使用作为制冷剂、发泡剂、灭火剂、溶剂、清洗剂、加工助剂、气雾剂、土壤熏蒸剂等受控用途的消耗臭氧层物质的建设项目。

In January 2018, the Ministry of Ecology and Environment issued the notice on management of the construction projects that producing or using substances that deplete the ozone layer to prohibit the construction of new or expanded projects for the production and use of ozone-depleting substances for controlled USES such as refrigerants, foaming agents, fire-extinguishing agents, solvents, cleaning agents, processing aids, aerosols and soil fumigants.

2018 年 3 月，美国计划对 600 亿美元的中国进口商品征收 25% 的关税，自此爆发中美贸易摩擦，多种含氟材料受波及。

In March 2018, the US planned to impose a 25 percent tariff on \$60 billion of Chinese imports. Since then, SINO-US trade friction has erupted, affecting a variety of fluorine-containing materials.

2018 年 9 月，斯德哥尔摩公约通过了将 PFOA 列入附件 A 并设定特定豁免，同时建议缔约方大会考虑鼓励各方不使用短链全氟和多氟烷基物质来替代 PFOA 用于灭火泡沫的决议。

In September 2018, the Stockholm convention adopted the inclusion of PFOA in annex A with specific exemptions and recommended that the conference of the parties consider a resolution to encourage all parties not to use short-chain perfluorinated and polyfluoroalkyl substances instead of PFOA for extinguishing foam.

2018 年 9 月，工业和信息化部原材料工业司公示了重点新材料首批次应用示范指导目

录（2018 版），其中应用于航空航天、化工的高氟含量氟橡胶材料、应用于工业废水治理、海水淡化的高强度 PTFE 中空膜、用于新能源汽车的双氟磺酰亚胺锂盐、高纯晶体六氟磷酸锂材料等含氟材料入选。

In September 2018, the department of raw material industry of the Ministry of Industry and Information Technology published the first batch of application demonstration guidance catalogue (2018 edition) of key new materials, in which Fluorinated rubber materials with high fluorine content applied in aerospace and chemical industry, high-strength PTFE hollow film applied in industrial wastewater treatment and seawater desalination, lithium difluorosulfimide salt used in new energy vehicles, high-purity crystal lithium hexafluorophosphate materials and other fluorine-containing materials were included.

2018 年 10 月，我国氟化工企业打赢中美 PTFE 反倾销案。当时，美国国际贸易委员会（USITC）投票对进口自中国和印度的聚四氟乙烯树脂（Polytetrafluoroethylene Resin）作出反倾销否定性产业损害终裁，四名国际贸易委员会委员均投否定票！

In October 2018, China's fluorine chemical enterprises won the SINO-US PTFE anti-dumping case. At that time, the United States international trade commission (USITC) voted to impose a final anti-dumping negative industry injury ruling on PTFE Resin imported from China and India.

2018 年 10 月，生态环境部发布《关于禁止生产以一氟二氯乙烷（HCFC-141b）为发泡剂的冰箱冷柜产品、冷藏集装箱产品、电热水器产品的公告》，宣布自 2019 年 1 月 1 日起，任何企业不得使用一氟二氯乙烷（HCFC-141b）为发泡剂生产冰箱冷柜产品、冷藏集装箱产品、电热水器产品。

In October 2018, the Ministry of Ecology and Environment issued the notice on the prohibition of the production of refrigerated refrigerator products, refrigerated container products and electric water heater products using HCFC-141b as foaming agent. This regulation took effect on January 1st, 2019.

2018年11月，江西省宣布发现该省最大的萤石矿。该矿由江西省地矿局赣南地质调查大队负责勘查，查明备案的萤石矿资源储量超500万吨，刷新江西省内同类矿床规模，成为目前江西第一大萤石矿。

In November 2018, a new fluorite mine in Jiangxi Province is discovered. Gannan geological survey group of Jiangxi provincial bureau of geology and mining was responsible for the exploration of the deposit, and the recorded reserves of fluorite ore exceeded 5 million tons. By now, it is the largest fluorite deposit in Jiangxi province.

2018年11月，美国环保署首次发布 GenX 化学品毒性评估草案，结果显示 GenX 化学品对肝脏、肾脏、血液、免疫系统、胎儿发育有影响，全氟丁基磺酸盐 (PFBS) 对甲状腺、生殖器官及组织、胚胎发育及肾脏有影响。

In November 2018, EPA released its first draft toxicity assessment of GenX chemicals. It is showed that GenX chemicals affect liver, kidneys, blood, immune system and fetal development, and PFBS affects thyroid, reproductive organs and tissues, embryonic development and kidneys.

2018年11月，国家统计局公布了《战略性新兴产业分类（2018）》，多种含氟材料入选。

In November 2018, the National Bureau of Statistics announced the classification of strategic emerging industries (2018), and a variety of fluorine-containing materials were included.

(全文完)

(The End)

