



**中信期货有限公司**  
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# 中国锂产业链 China Lithium Industry

## 基础介绍 Introduction

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## 1. 锂产业流程 Lithium Industry

## 2. 锂冶炼技术 Lithium Extraction

## 3. 锂供应概况 Lithium Supply

## 4. 锂需求概况 Lithium Demand

## 5. 锂贸易格局 Lithium Trade

# 锂的物化性质 Properties of Lithium

Lithium (Li) is a kind of silver-white soft metal and has the lowest density of any metal. It is used in the production of atomic reactors, the production of lightweight alloys, and batteries. Lithium primarily exists in two forms: lithium ore and lithium salt lakes.

Lithium ores include spodumene, lepidolite, montebrasite and petalite.

锂(Li)是一种金属元素，对应的单质为银白色质软金属，也是密度最小的金属。用于原子反应堆、制轻合金及电池等。锂主要以锂矿石和锂盐湖两种形式存在，锂矿石包括锂辉石、锂云母、磷锂铝石和透锂长石等。

Lithium is extensively used in industries such as batteries, ceramics, glass, lubricants, refrigerants, nuclear power, and optoelectronics.

锂广泛应用于电池、陶瓷、玻璃、润滑剂、制冷液、核工业以及光电等行业。

**Spodumene 锂辉石**



**Metallic Lithium 金属锂**



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# 锂的用途和应用领域 Applications of Lithium

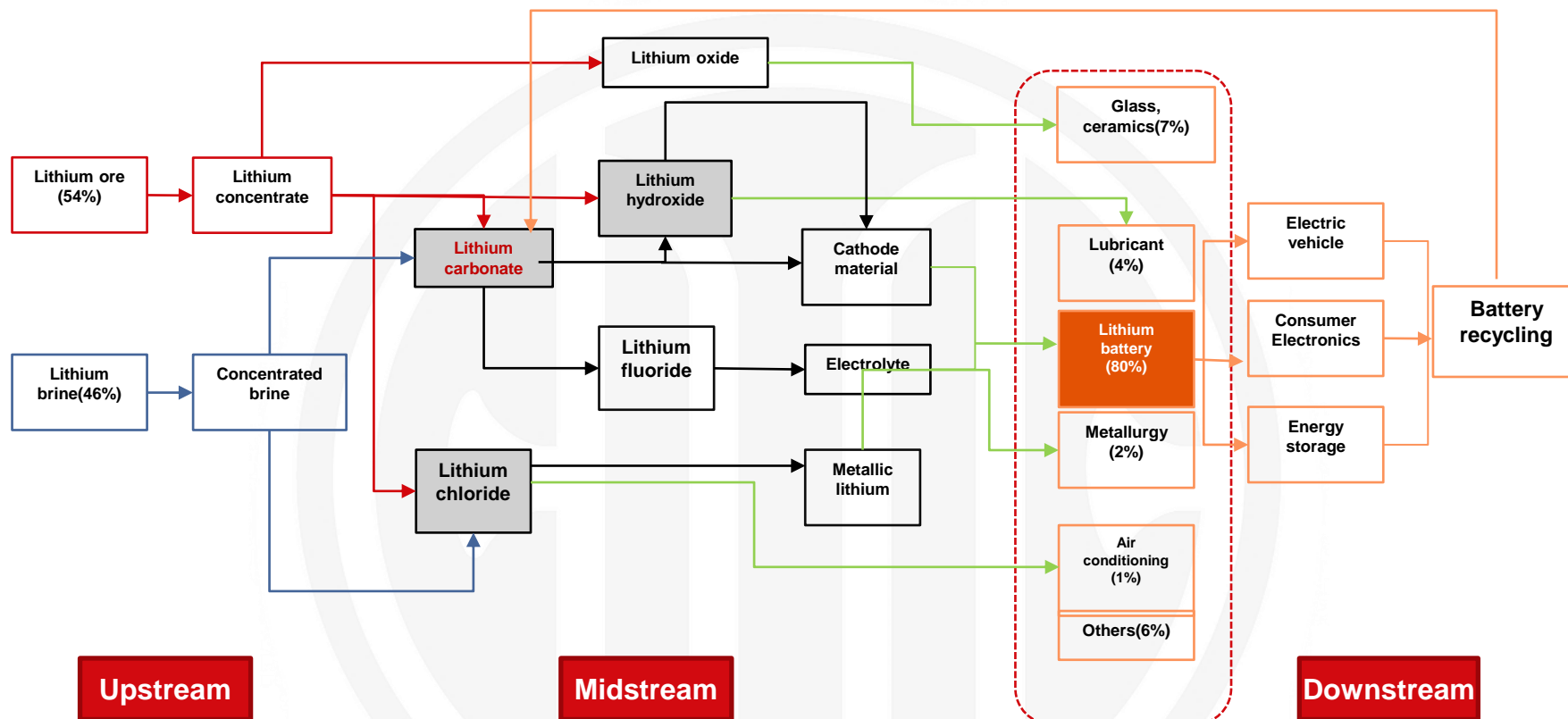
The battery industry consumes the largest share of lithium, and the second largest is the glass and ceramics industry. 电池行业已经成为锂最大的消费领域，玻璃和陶瓷行业是锂的第二大消费领域。

Industries	Application Details
Battery Industry 电池行业	Batteries with lithium as the anode have high energy density and are widely used in various fields such as automotive, laptops, smartphones, digital cameras, small electronic devices, aerospace, electrical and mechanical equipment, and military communications. 锂作阳极的电池具有很高的能量密度，被广泛应用到汽车、笔记本电脑、手机、数码相机、小型电子器材、航天、机电以及军事通讯等领域。
Glass Industry 玻璃行业	Lithium compounds have a significant fluxing effect in glass manufacturing. They can simplify the production process, reduce energy consumption, increase production, and improve performance. 锂化物在制造玻璃时有较大的助熔作用，能够简化生产流程，降低能耗，增加产量，改善性能。
Ceramic Industry 陶瓷行业	By adding a small amount of lithium spodumene to ceramics, the sintering temperature can be reduced, the sintering time can be shortened, and the ceramic properties can be enhanced. 陶瓷中加入少量锂辉石可降低烧结温度，缩短时间，增加陶瓷性能。
Lubricant Industry 润滑脂行业	Lithium-based greases, with advantages of oxidative resistance, pressure resistance, and excellent lubricating properties, are applied in aircraft, tanks, trains, cars, metallurgical equipment, and other devices. 锂基润滑脂具有抗氧、耐压、润滑性能好的优点，被应用到飞机、坦克、火车、汽车、冶金、等设备上。
Metallurgical Industry 冶金行业	The addition of lithium can greatly improve alloy performance. Lithium as an effective degassing agent is used to improve the grain structure of metals and enhance their mechanical properties. 锂的加入能大大改善合金性能。锂也是有效的脱气剂。用于改善金属的晶粒结构，提高金属的机械性能。
Others 其他应用	Lithium is used as a coolant in nuclear fusion or fission reactors; used as a high-energy fuel for rockets, airplanes, or submarines, and for the production of "lithium salt fertilizers". 在核聚变或核裂变反应堆中用作冷却剂，用作高能燃料用于火箭、飞机或潜艇上，制造“锂盐肥料”等。

Sources: CITIC Futures

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# 锂产业链概览 Lithium Industry Chain



In 2022, lithium supply from mines was close to 690,000 tons LCE (as USGS reported), +21% YoY. The supply is distributed in Australia (47%), Chile (30%), China (14%), Argentina (5%), and Brazil (2%).

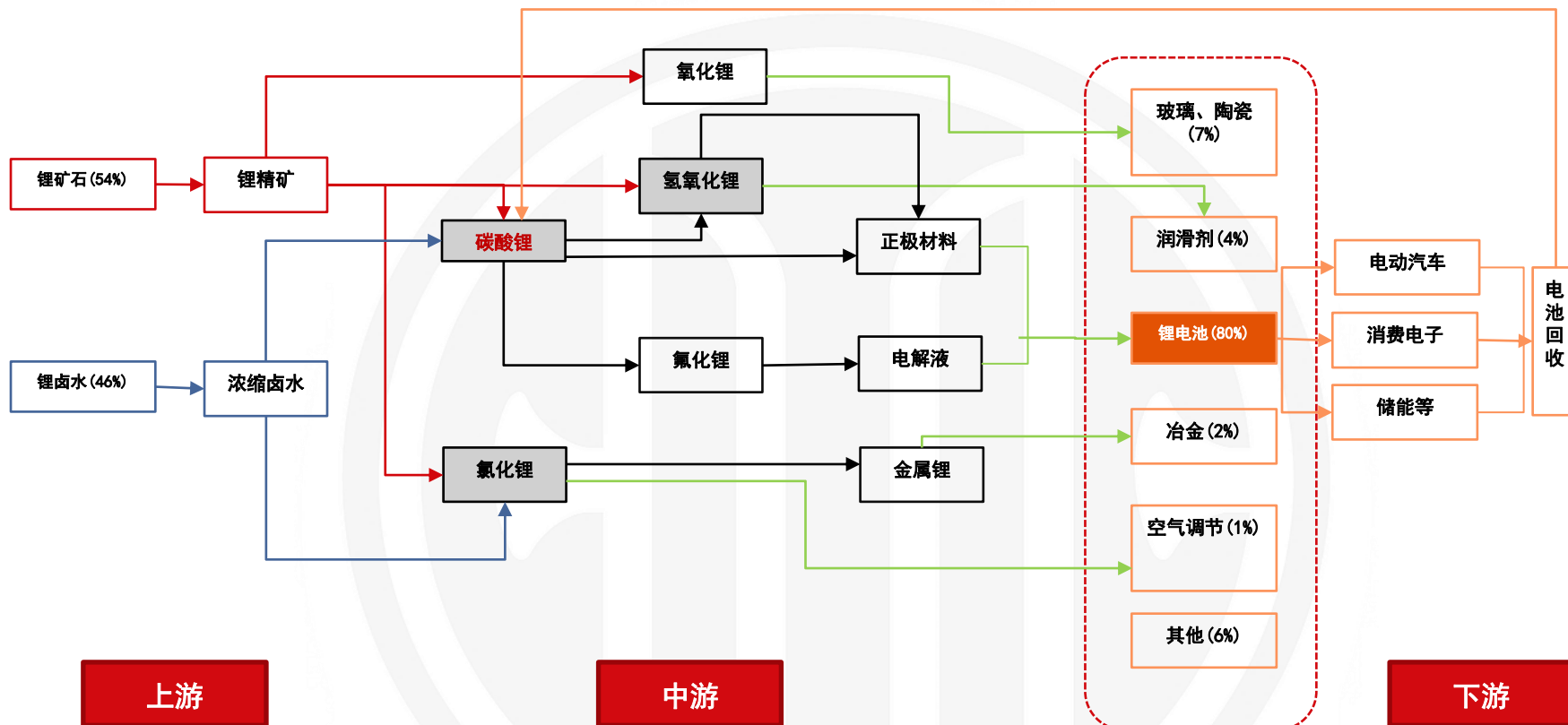
The production capacity of basic lithium salts is concentrated in China, specifically in Sichuan, Jiangxi, and Qinghai province. In 2022, the production volume of lithium carbonate, lithium hydroxide, and lithium chloride was 395,000 tons, 246,400 tons, and 22,200 tons, respectively. Overseas, lithium hydroxide is the primary product for refining.

The demand (as USGS reported) in 2022 was nearly 710,000 tons LCE, +41% YoY. Lithium used in making batteries increased from less than 40% in 2016 to 80% in 2022. 76% of lithium batteries are used in electric vehicles.

Sources: USGS, CITIC Futures

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# 锂产业链概览 Lithium Industry Chain



2022年矿端供应近69万吨LCE (USGS显性), +21%。分布在**澳大利亚 (47%)**、**智利 (30%)**、**中国 (14%)**、**阿根廷 (5%)**、**巴西 (2%)**

基础锂盐冶炼产能集中在**中国 (四川、江西、青海)**, 2022年碳酸锂、氢氧化锂、氯化锂产量分别为39.50万吨、24.64万吨、2.22万吨。海外主要冶炼氢氧化锂。

2022年需求近71万吨LCE (USGS显性), +41%。电池用锂从2016年的不足40%提升到2022年的80%。电池中电动汽车用锂占76%。

Sources: USGS, CITIC Futures

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# 提锂技术 Lithium Extraction Technologies

## Hard Rock Lithium Extraction and Brine Lithium Extraction Technologies

### 硬岩提锂与卤水提锂技术比较

Process Methods	Technological Process	Features
Sulfuric Acid Roasting	Spodumene → 950-1100 °C Conversion Roasting → 250-300 °C Sulfurization Roasting → Leaching → Impurity Removal → Lithium Precipitation → Lithium Carbonate Product	<b>Advantages:</b> process is classic, mature and simple, adaptable to various raw materials, and high in lithium yield. <b>Shortcomings:</b> the process generates environmentally harmful waste gas and waste residue, consumes sulfuric acid, and produces by-products of sulfuric acid, resulting in high production costs.
Lime Sintering	Lithium concentrate + lime → 825-1050 °C roasting → leaching → evaporation crystallization or lithium precipitation → lithium hydroxide or lithium carbonate products	<b>Advantages:</b> process is simple and production cost is low. <b>Shortcomings:</b> lithium recovery rate is low, material flow is large, evaporation volume is high, energy consumption is high and the process generates environmentally harmful waste gas and waste residue.
Sulfate Roasting	Lithium ore + sulfate roasting at 850 °C to 1000 °C → leaching → impurity removal → evaporation and impurity removal → lithium precipitation → lithium carbonate product.	<b>Advantages:</b> high lithium recovery rate <b>Shortcomings:</b> long process flow, high evaporation volume, high energy consumption, high production cost, generation of environmentally harmful waste gas and waste residue.
Chloridizing Roasting	Lithium concentrate + chloride salt → 950~1100 °C roasting → flue gas cooling and soot elimination → leaching → concentration and impurity removal → lithium precipitation → lithium carbonate product.	<b>Advantages:</b> high lithium recovery rate, simple technological process <b>Shortcomings:</b> high difficulty in LiCl gas collection, high corrosion furnace gas, high requirements for equipment, generation of environmentally harmful waste gas and waste residue.

Main Methods	Technological Feature	Applicable Salt Lakes
Salt Pan Concentration-Precipitation Method	The brine undergoes salt pan concentration, sodium salts and potassium salts separation, separation of magnesium by adding lime, extraction of boron through acidification, purification, and precipitation of lithium salts by adding chemical precipitants.	Brine of high lithium content and low magnesium-to-lithium ratio
Adsorption Exchange Method	Adsorption of lithium by using lithium-targeted adsorbent, elimination of lithium from other impurities through fresh water and beneficiation, concentration through small-scale salt pan, and chemically precipitation of lithium.	All types of brine
Membrane Separation Method	Separation of impurities in brine by using various types of membrane filters, beneficiation and concentration of lithium, and chemically precipitation of lithium.	All types of brine
Extraction Method	The separation and concentration of lithium from other impurities through extracting lithium with organic solvents, and further production of various lithium salts through high concentration stripping solution.	Brine of high lithium content and low magnesium-to-lithium ratio
Calcination Leaching Method	The process involves concentrating and drying the extracted boron-rich brine with high lithium and magnesium content, calcination to decompose it into magnesium oxide, dissolving soluble lithium salts in the magnesium oxide through water, and precipitating lithium carbonate products.	Brine of high lithium content and low magnesium-to-lithium ratio

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Analysis of Hard Rock Lithium Extraction and Brine Lithium Extraction Technologies

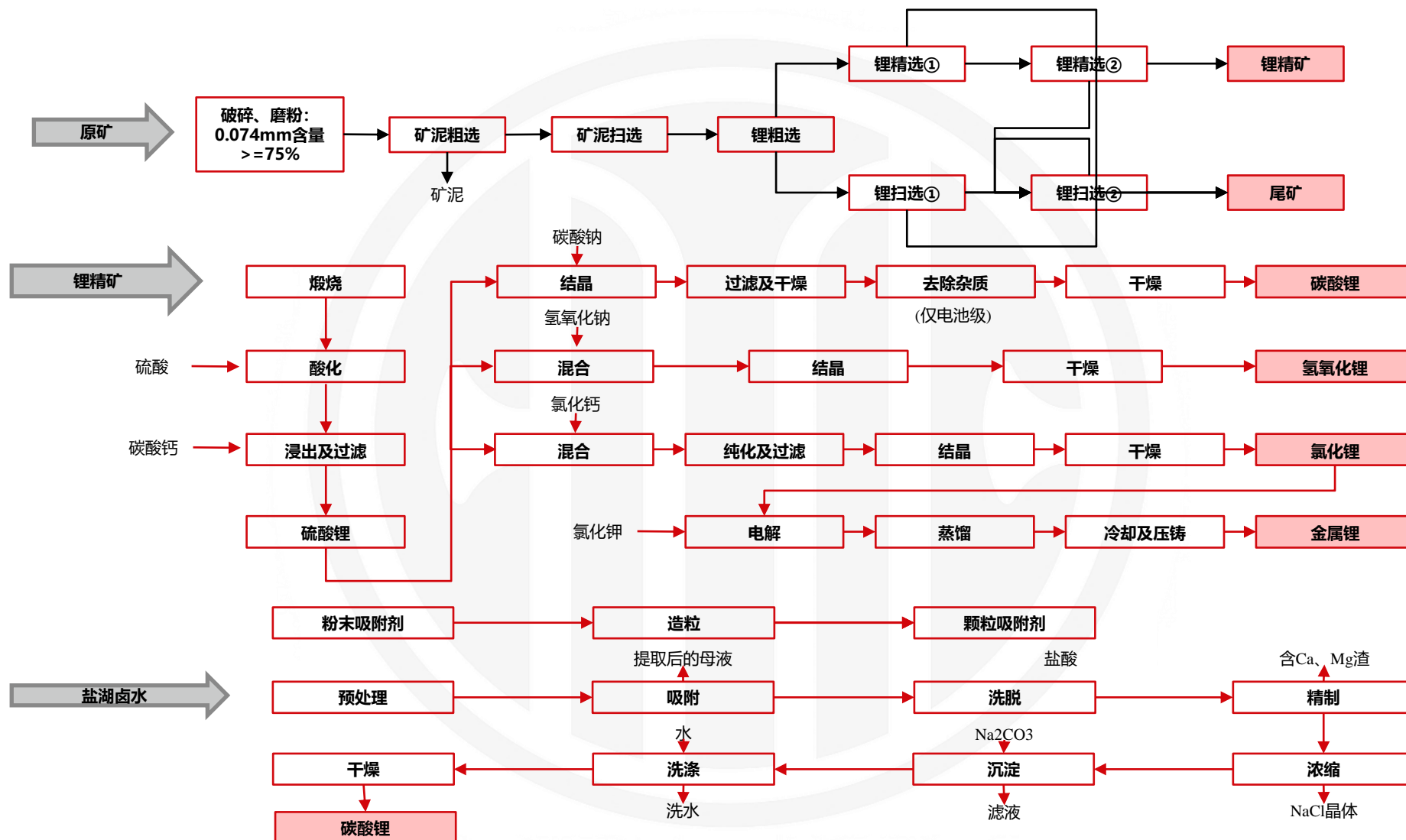
硬岩提锂与卤水提锂技术比较

工艺方法			主要方法		
工艺流程		特点	技术特点		适用盐湖
硫酸焙烧	锂辉石→950~1100 °C转化焙烧→250~300 °C硫酸化焙烧→溶出→除杂→沉锂→碳酸锂产品	经典工艺成熟简单, 适应多种原料, 锂收率高, 能耗大, 产生影响环境的废气、废渣, 消耗硫酸副产硫酸钠, 生产成本较高	盐田浓缩-沉淀法	卤水经过盐田浓缩, 分离钠盐、钾盐, 加石灰分离镁, 酸化萃取硼, 再净化, 加入化学沉淀剂沉淀锂盐	较高锂含量 低镁锂比
石灰烧结	锂精矿+石灰→825~1050 °C焙烧→溶出→蒸发结晶或沉锂→氢氧化锂或碳酸锂产品	流程简单, 生产成本较低, 锂回收率低, 物料流量大, 蒸发量大, 能耗高, 产生影响环境的废气、废渣	吸附交换法	卤水通过对锂有选择性的吸附剂吸附, 再用淡水解吸与其他杂质成分分离并富集, 再通过小型盐田浓缩后化学沉淀锂	各类卤水
硫酸盐焙烧	锂矿石+硫酸盐850 °C~1000 °C焙烧→溶出→除杂→浓缩除杂→沉锂→碳酸锂产品	锂回收率较高, 工艺流程长, 蒸发量大, 耗能高, 生产成本高, 产生影响环境的废气、废渣	膜分离法	利用多种类型的滤膜, 逐步将卤水中杂质成分分离, 并富集浓缩锂后化学沉淀锂	各类卤水
氯化焙烧	锂精矿+氯盐→950~1100 °C焙烧→烟气冷却收尘→浸出→浓缩除杂→沉锂→碳酸锂产品	锂回收率较高, 工艺流程简单, LiCl气体的收集难度大, 炉气腐蚀性强, 对设备要求高, 产生影响环境的废气、废渣	萃取法	通过有机溶剂萃取锂实现锂与其他杂质成分的分离和浓缩, 高浓度反萃液进一步生产各种锂盐	高锂含量 高镁锂比
			煅烧浸取法	通过对提硼后的高锂高镁老卤浓缩干燥、煅烧分解为氧化镁, 用水溶出氧化镁中的可溶性锂盐, 再沉淀出碳酸锂产品	高锂 高镁锂比

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# 提锂技术 Lithium Extraction



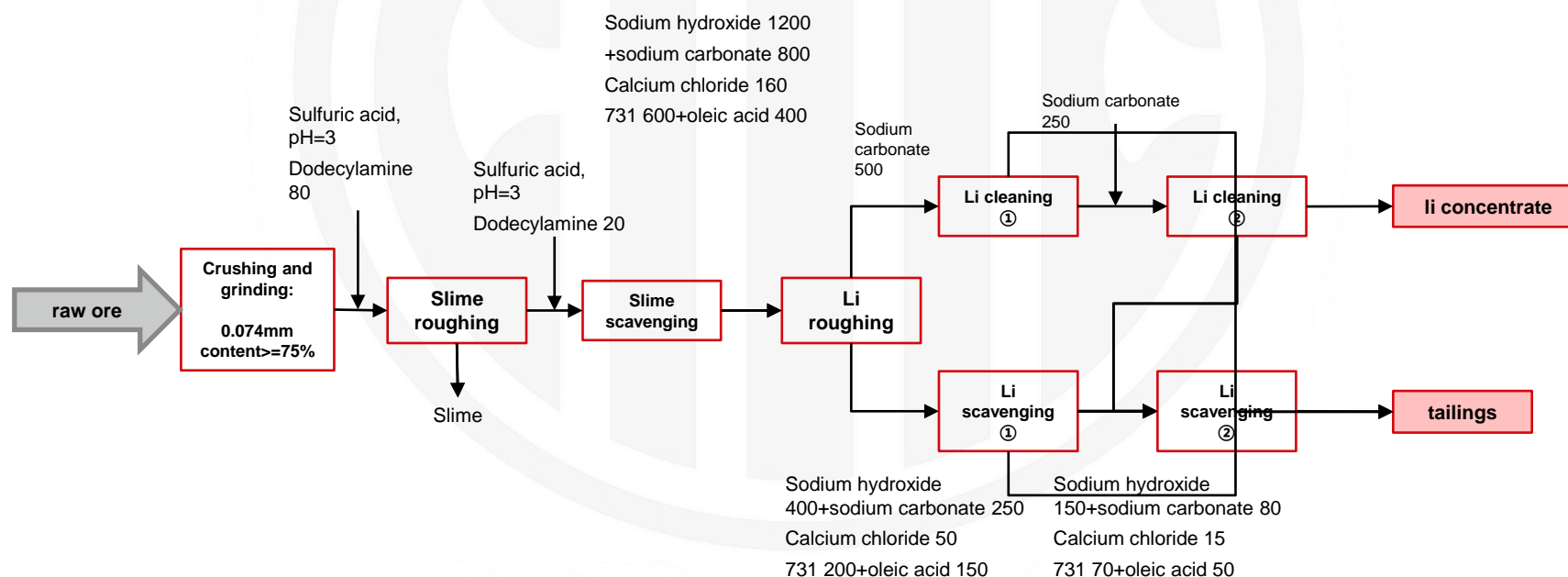
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# 提锂技术-选矿 Lithium Extraction - Ore Dressing

Ore dressing of raw ore can be divided into three stages: pre-treatment, sorting, and dewatering. Depending on the different properties of lithium minerals, one or more ore dressing methods can be chosen, such as flotation, gravity separation, or magnetic separation. Among them, flotation is commonly used, and the main process is as follows (unit of reagents: g/t).

原矿选矿可以分为选别前的准备、选别和选别后的脱水3个阶段。根据锂矿物不同的性质，可以选用一种或多种选矿方法，如浮选法、重选法或磁选法等，其中浮选法使用较多（单位：g/t）。



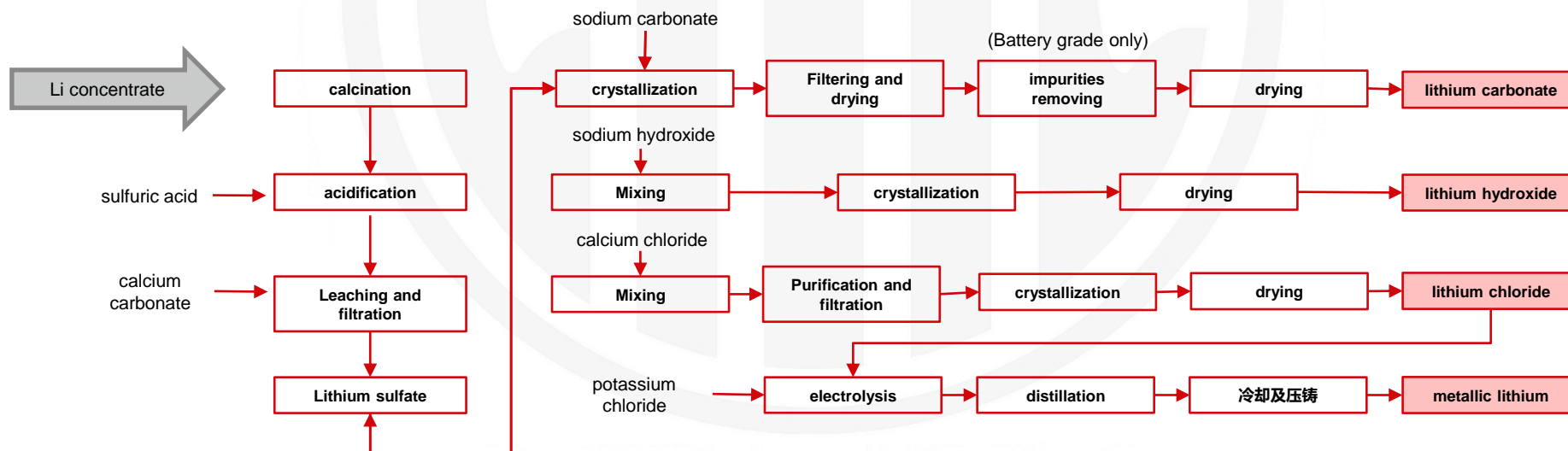
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# 提锂技术-冶炼 Lithium Extraction - Smelting

Taking lithium extraction from lithium concentrate as an example, mainstream is sulfuric acid roasting. It includes calcination, acidification, leaching, and filtration of lithium concentrate to obtain lithium sulfate; lithium carbonate can be produced by adding sodium carbonate, lithium hydroxide by adding sodium hydroxide, and lithium chloride by adding calcium chloride; metallic lithium is produced with lithium chloride through electrolysis and distillation.

以锂精矿提锂流程为例，主流处理方法为硫酸焙烧法，包括：煅烧、酸化以及浸出及过滤，得到硫酸锂；分别加入碳酸钠、氢氧化钠及氯化钙生产碳酸锂、氢氧化锂及氯化锂；通过包括电解和蒸馏的方法使用氯化锂生产金属锂。



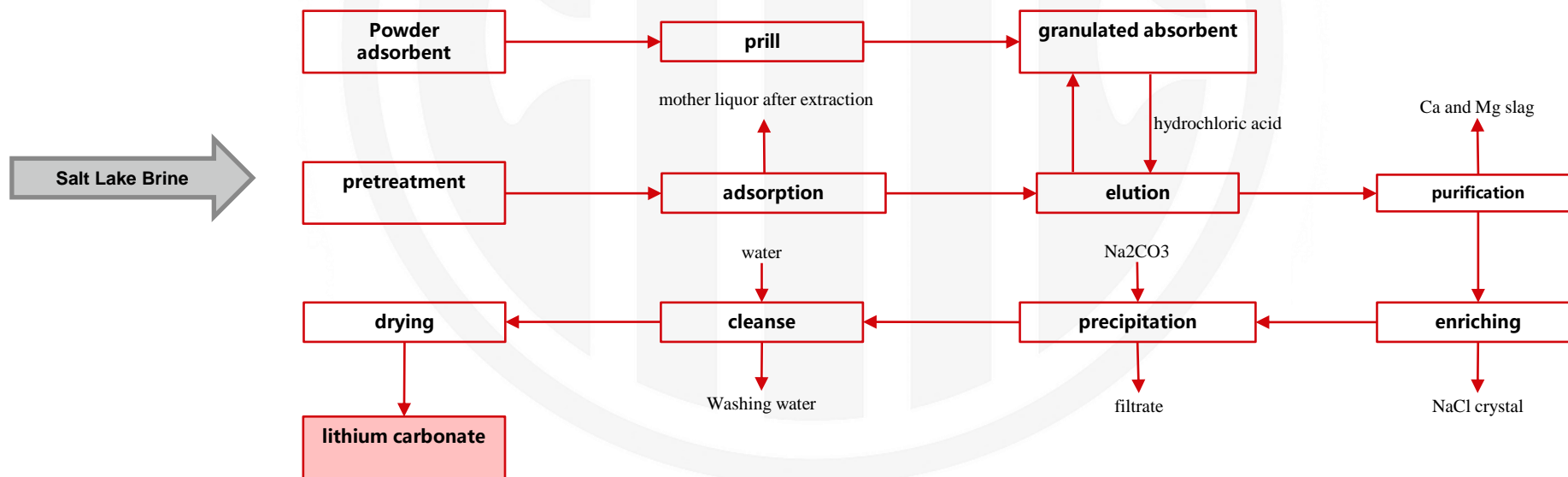
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# 提锂技术-吸附 Lithium Extraction - Adsorption

Adsorption is commonly used in the extraction of lithium from brine. The advantage of the adsorption method lies in its simple process and high lithium recovery rate. Currently, this method is used in lithium extraction from brine in various locations, including the Hombre Muerto salt flat controlled by Livent, the Qarhan Salt Lake developed by Ganfeng Lithium, Blue Lithium, and the Chaka Salt Lake in Tibet.

盐湖提锂常用吸附法。吸附法的优势在于工艺简单、锂回收率高等。目前使用该工艺提锂的有Livent 控制的Hombre Muerto盐湖、蓝科锂业、藏格锂业开发的察尔汗盐湖以及位于西藏的茶卡盐湖。



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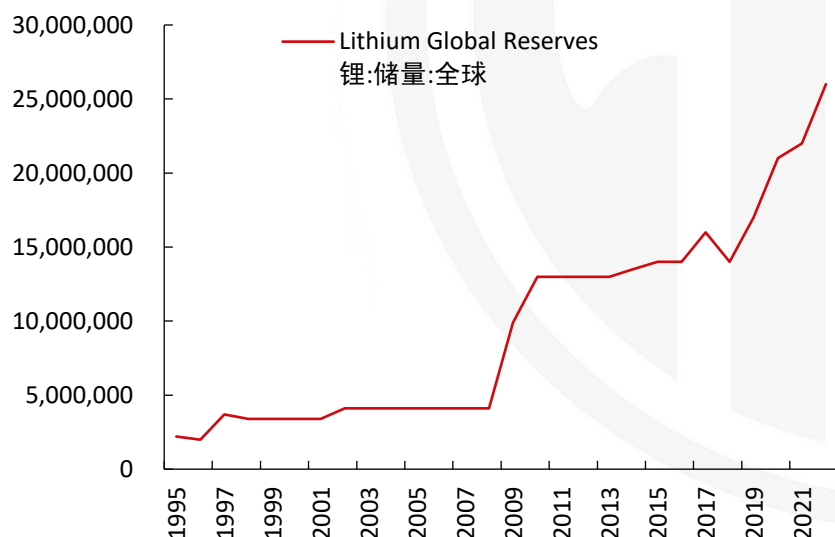
5. 锂贸易格局 Lithium Trade

# 全球锂储量 Global Lithium Reserves

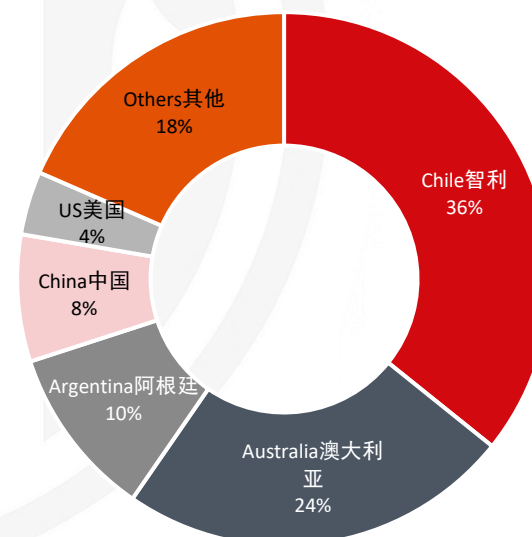
In 2022, global proven lithium reserves were 26 million metric tons, and the total lithium resources reached 98 million metric tons. The bulk of lithium resources is concentrated in the lithium delta of Chile, Argentina, and Bolivia.

2022年，全球已探明锂储量2600万金属吨，已探明的锂资源量达到9800万金属吨。锂资源储量主要集中在智利、阿根廷、玻利维亚交界的“锂三角”地区。

**Global Lithium Resources  
(Metal Metric Tons)**  
全球锂资源探明储量 单位：金属吨



**Global Lithium Reserves Distribution In 2022  
2022全球锂储量分布**



Sources: USGS, CITIC Futures

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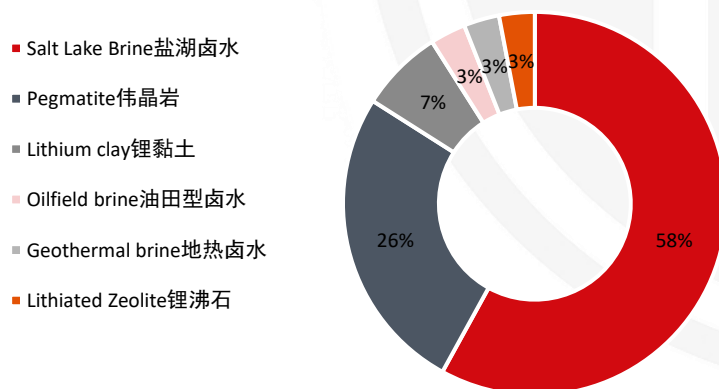


# 全球锂储量 Global Lithium Reserves

Global lithium resources are mainly dominated by lithium brine, and there's significant development potential in salt lake lithium extraction. The supply sources of lithium resources are primarily from lithium brine and hard rock lithium deposits, hard rock lithium deposits, lithium brine deposits, and clay deposits. Spodumene are primarily concentrated in Australia, Canada, the United States, and Zimbabwe. Lithium brine are mainly concentrated in Argentina, Chile, the United States, and Qinghai-Tibet Plateau.

全球锂资源以卤水锂为主，盐湖提锂开发潜力大。锂资源供给来源主要包括卤水和硬岩矿。从资源形态上看，全球锂资源主要包含硬岩矿、卤水矿、黏土矿等。其中锂辉石主要集中在澳大利亚、加拿大、美国以及津巴布韦等国；盐湖卤水主要集中在阿根廷、智利、美国和中国青藏地区。

**Global Lithium Reserve Types**  
全球锂储量类型结构



**Global Lithium Resource Distribution**  
全球主要锂资源分布详情



Sources: USGS, CITIC Futures

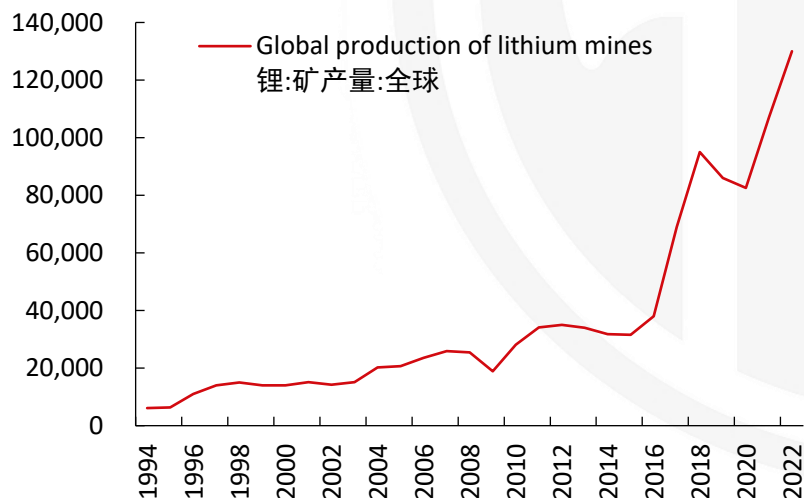
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# 全球锂产量 Global Lithium Production

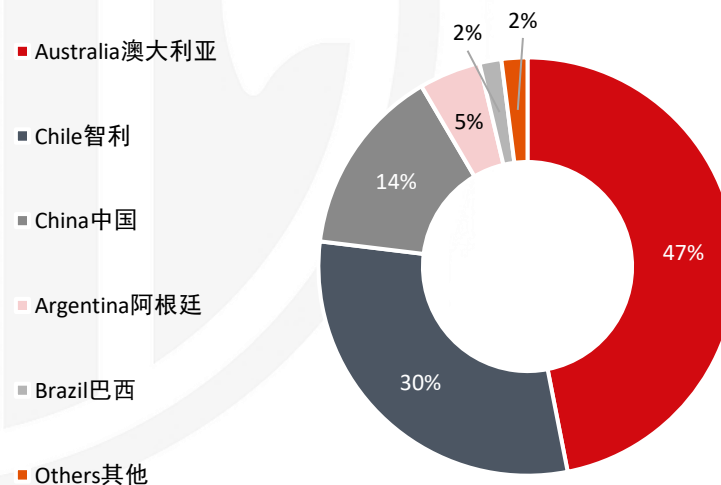
Global lithium mining production reached a record high of 130,000 metric tons (excluding the US) in 2022. The majority of global lithium production comes from six mining projects in Australia, two brine projects in Argentina and Chile, and two brine projects, one mining project in China.

2022年全球开采锂产量达到创纪录的13万金属吨（不含美国）。澳大利亚的六个矿产项目、阿根廷和智利两个盐湖项目以及中国的两个盐湖和一个矿产项目占世界锂产量的大部分。

Global Lithium Production  
(Metal Metric Tons)  
全球锂产量 单位：金属吨



Global Lithium Production Distribution in 2022  
2022全球锂产量分布



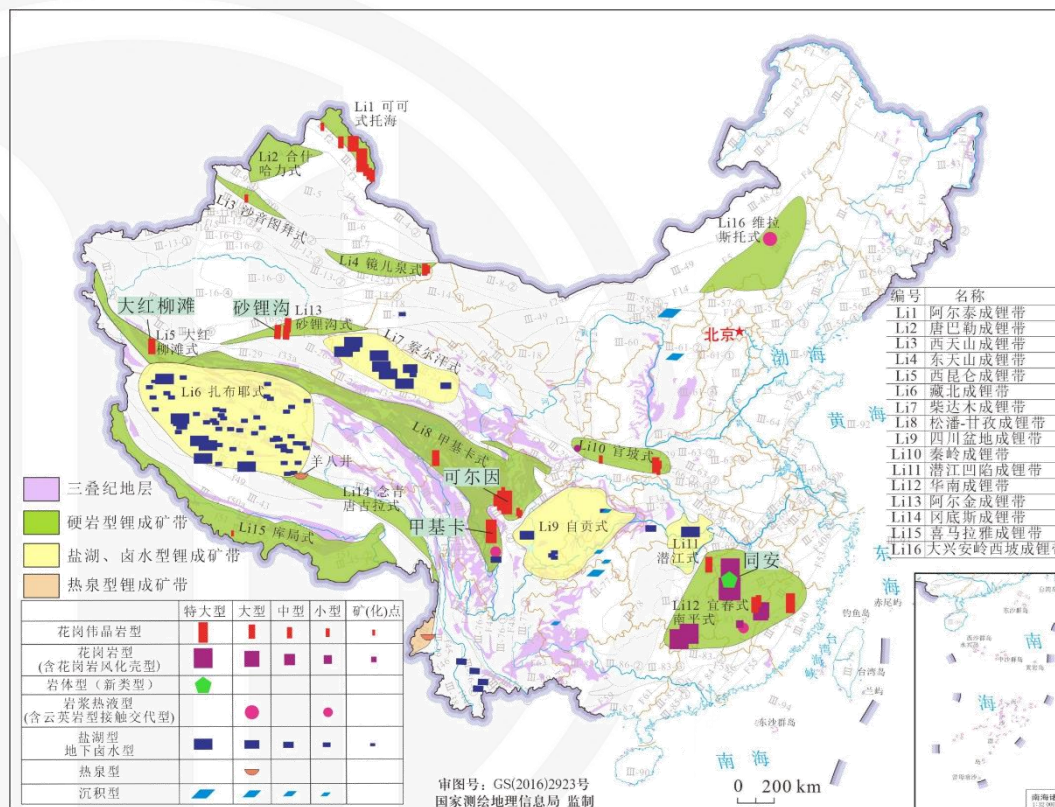
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# 中国锂储量 China Lithium Reserves

China's lithium resources are mostly distributed in provinces such as Qinghai, Tibet, Sichuan, and Jiangxi, accounting for over 95% of China total lithium resources. The proven lithium resource reserves in China are approximately 6 million metric tons, with brine resources accounting for about 70% of the total, and ore resources accounting for approximately 30%.

国内盐锂多数分布在青海、西藏、四川、江西等省区，占全国锂资源总量95%以上。中国已探明的锂资源储量为600万金属吨，其中盐湖资源约占总储量的70%，矿石资源约占30%。



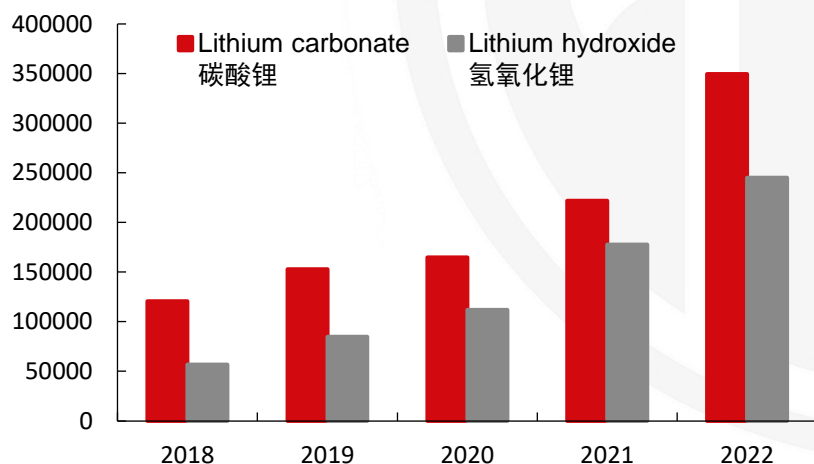
# 中国锂产量 China Lithium Production

In 2022, China's lithium industry continued to maintain a rapid growth rate. According to Lithium Branch of the China Nonferrous Metals Industry Association, the production of basic lithium salts in China in 2022 was : lithium carbonate 395,000 tons (capacity: 600,000 tons), + 32.5% YoY; lithium hydroxide 246,400 tons (capacity: 360,000 tons), + 29.5% YoY; lithium chloride 22,200 tons (capacity: 35,000 tons), - 27.2% YoY.

2022年，我国锂行业保持较快增长速度，据中国有色金属工业协会锂业分会统计，2022年我国基础锂盐产量如下：碳酸锂产量39.50万吨（产能约60万吨），同比增幅约32.5%；氢氧化锂产量24.64万吨（产能约36万吨），同比增幅约29.5%；氯化锂产量2.22万吨（产能约3.5万吨），同比下降27.2%。

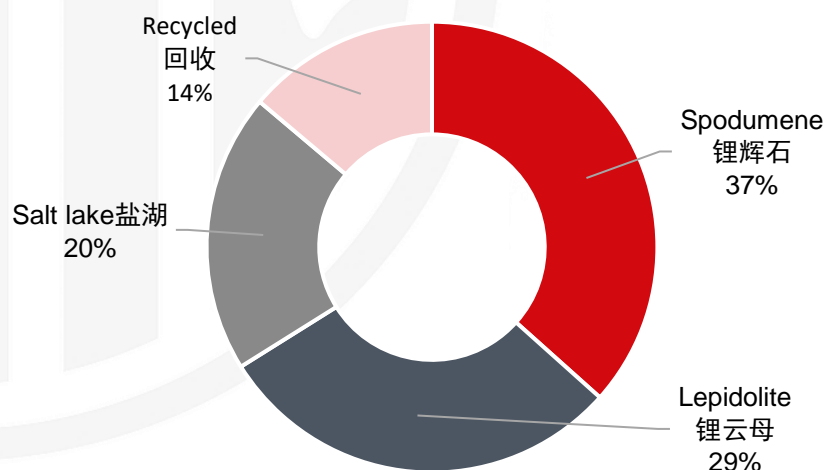
China Lithium Production (tons)

中国锂产量 单位：吨



China Lithium Supply in 2022

2022国内锂供应结构



Sources: Wind, Bloomberg, SMM, CITIC Futures

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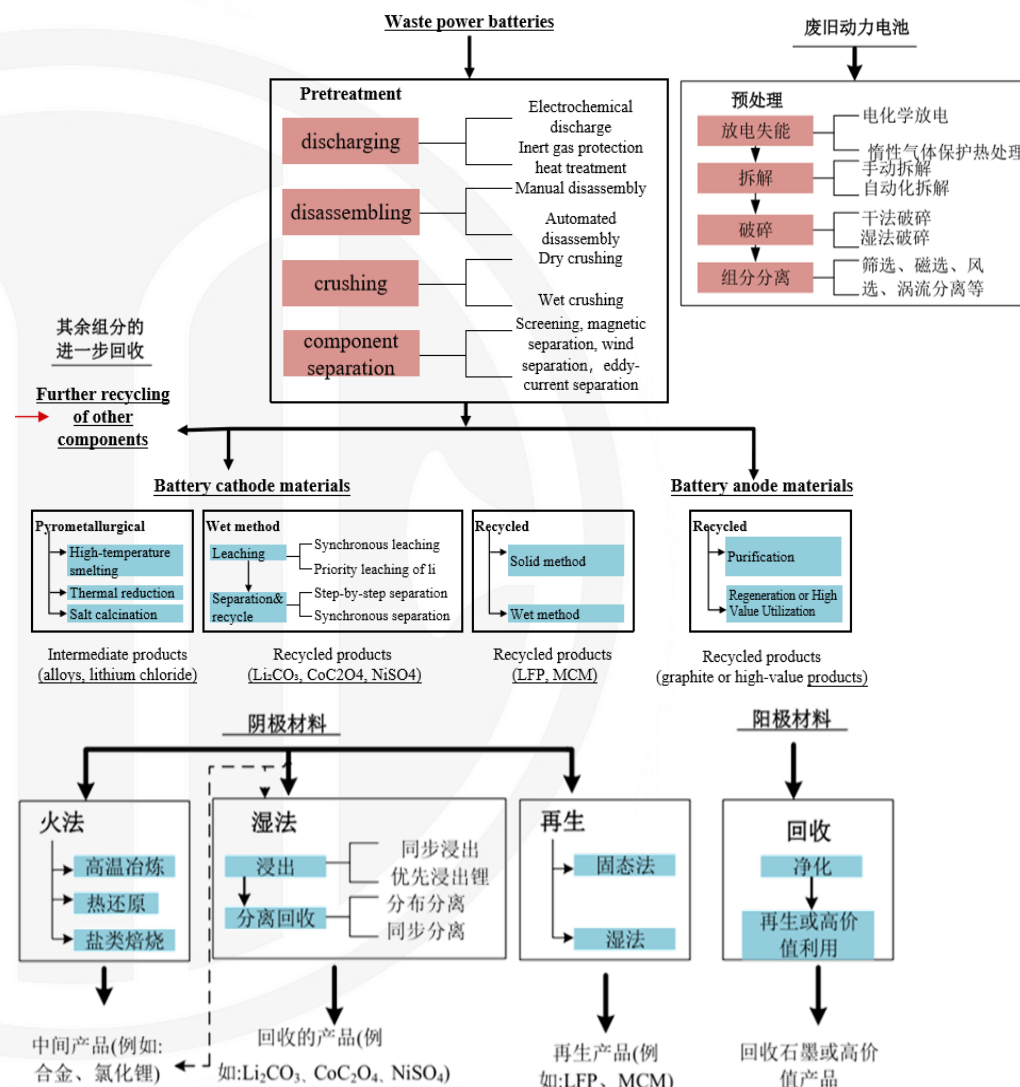
# 锂资源回收 Lithium Resource Recycling

The lifespan of power lithium battery is approximately 5-8 years, there will be an increasing number of retired power batteries in the future. Methods for recycling positive electrode materials include physical methods, chemical methods, and a combination of the two. Chemical methods include pyrometallurgy, hydrometallurgy, and bioleaching. The salvage ratio for lithium, cobalt, and nickel in lithium batteries can reach 90%, 98%, and 98% respectively.

动力锂电池使用年限大约是5~8年，未来有越来越多的动力电池将要报废。国内针对正极材料回收的方法包括物理法、化学法和物化结合法，化学法包括火法、湿法和生物浸出法。锂电池中有价金属锂钴镍等回收率分别可以达到90%、98%和98%。

Sources: CITIC Futures

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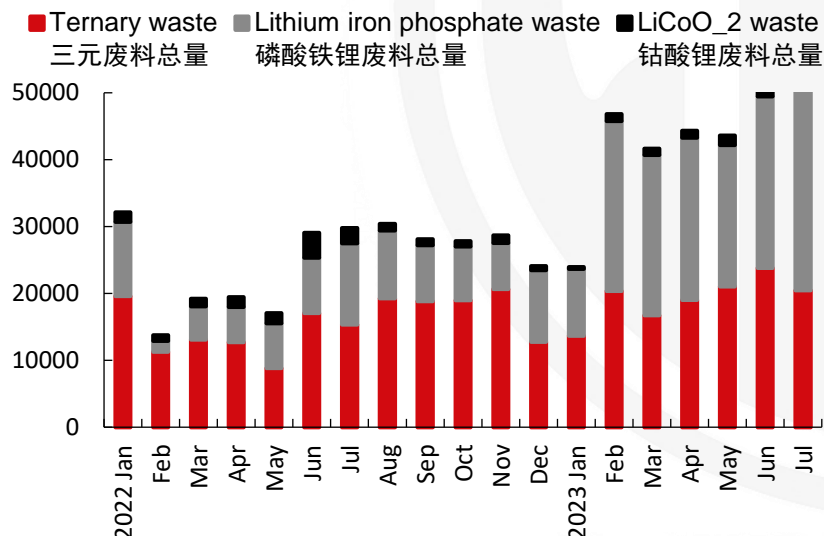
# 锂资源回收 Lithium Resource Recycling

Recycling volume of used lithium-ion batteries in China reached 300,000 tons in 2022, resulting in the recovery of 58,000 tons of lithium carbonate. China domestic electric vehicle sales surged in 2021, and will lead to a recycling wave in 2025. China lithium carbonate equivalent (LCE) through recovery in 2026 can reach 146,000 tons, the recycling market will be valued at 57.2 billion yuan.

2022年中国废旧锂离子电池回收量达30万吨，回收得到碳酸锂5.8万吨。2021年国内电动车销量大爆发，预计带来2025年回收潮，2026年国内回收可得碳酸锂14.6万吨LCE，回收市场达572亿元。

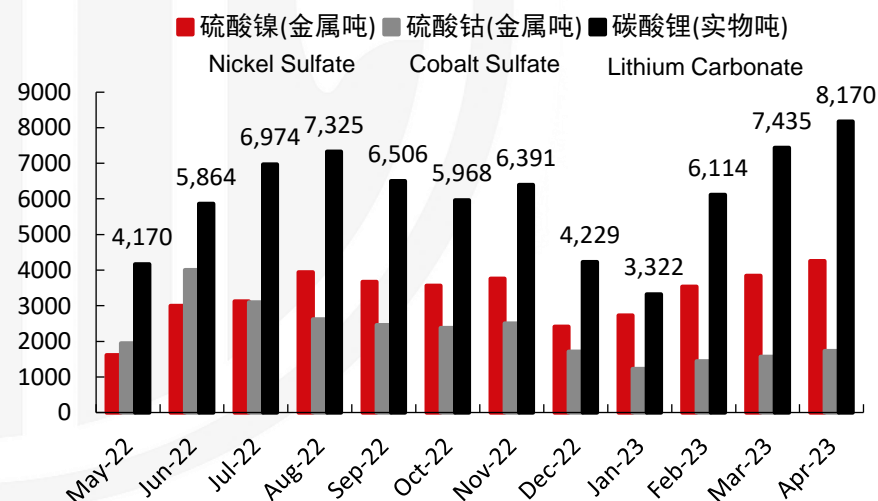
## China Lithium-ion Batteries Recycling(Ton)

中国废旧锂电池回收量 单位：吨



## China Lithium Recycling (Ton LCE)

中国锂回收量 单位：吨 LCE



Sources: EVTank, SMM, CITIC Futures

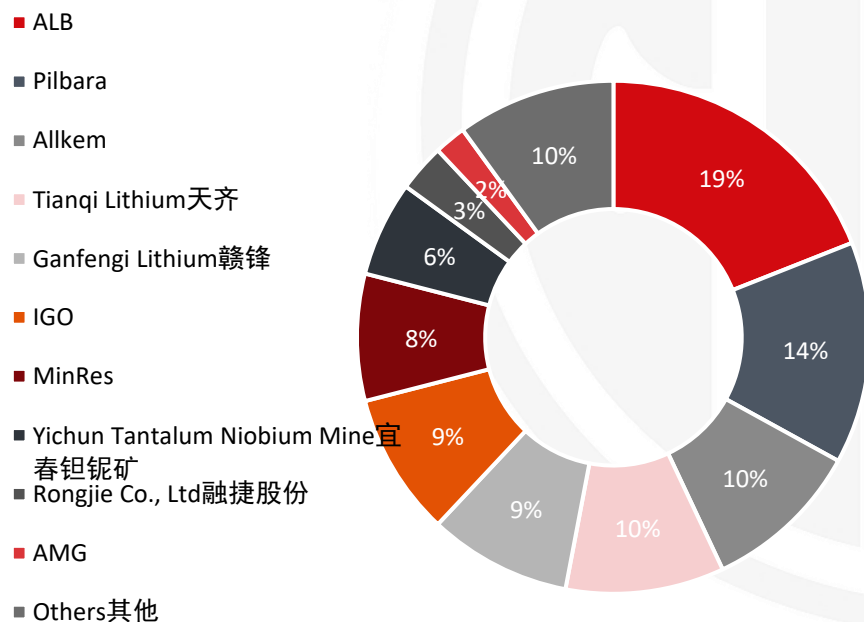
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# 主要生产企业——矿端 Key Mining Companies

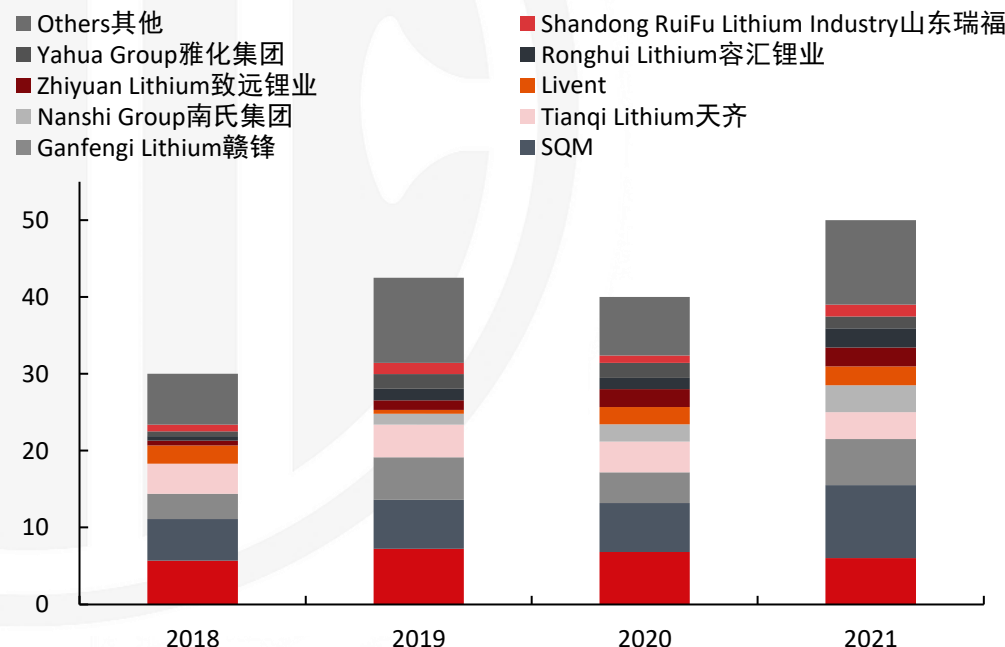
The majority of lithium mine supply is controlled by seven companies operating mines in Australia and China. ALB ranks first with a 19% share. The refined lithium supply is dominated by few companies such as SQM, ALB, Tianqi, Ganfeng, and Nanshi Group.

大部分的锂矿供应由在澳大利亚和中国经营矿山的7家公司控制，其中ALB以19%的比例居首位。精炼锂供应以SQM、ALB、天齐、赣锋和南氏集团等少数企业为主。

**Lithium Mining Market By Corporate In 2021**  
按公司控制权划分开采锂产量的市场份额（2021）



**Global Refined Lithium Market (10K Ton LCE)**  
全球精炼锂市场份额 单位：万吨 LCE



Sources: Corporate Press Releases, CITIC Futures

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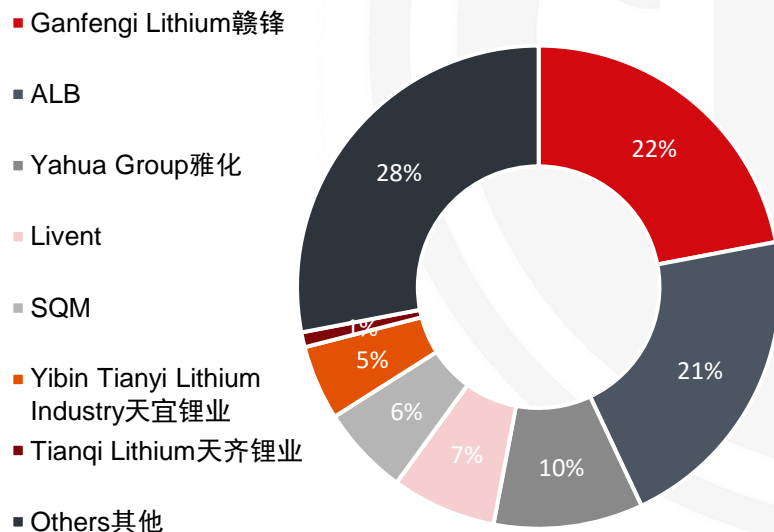
# 主要生产企业——冶炼加工

## Key Smelting and Processing Companies

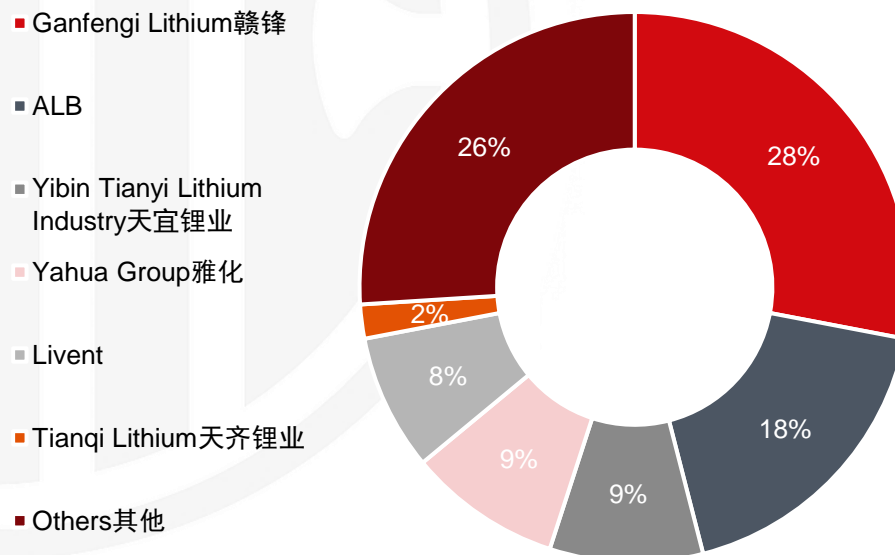
Lithium hydroxide, a key material for manufacturing high-nickel batteries, its market is being fiercely contested by global players. In 2021, Ganfeng Lithium held the top 1 position globally with a 22% capacity and a 28% production of lithium hydroxide.

氢氧化锂作为制造高镍电池的关键材料，正受到全球电池产业链巨头的争抢。氢氧化锂产量呈现出逐年上升的趋势。根据赣锋锂业报告，2021年赣锋锂业氢氧化锂产能和产量份额分别为22%和28%，均位居全球第一。

**Lithium Hydroxide Capacity in 2021**  
2021年全球氢氧化锂产能份额



**Lithium Hydroxide Production in 2021**  
2021年全球氢氧化锂产量份额



Sources: Wind, CITIC Futures

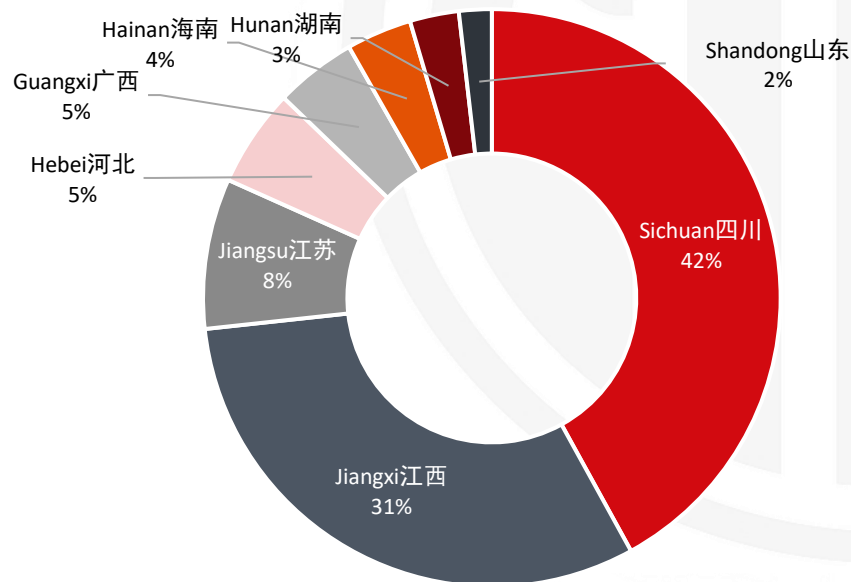
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# 中国冶炼地理分布 China Smelting by Province

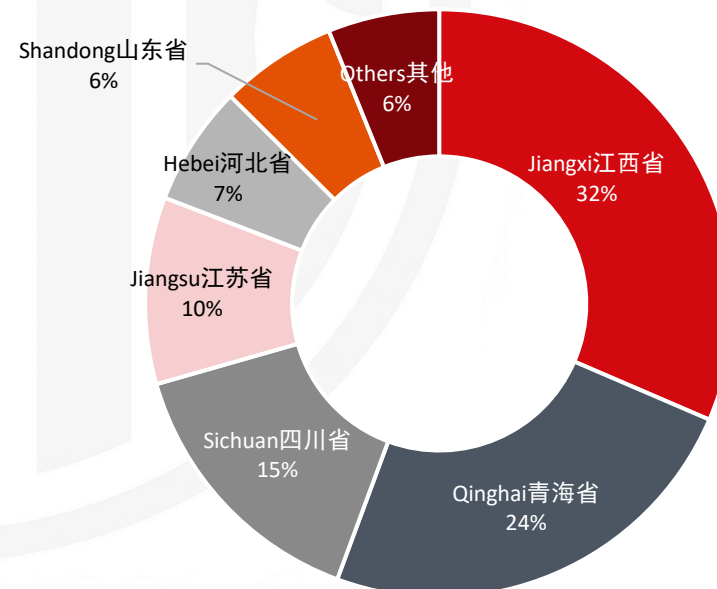
The current lithium hydroxide production capacity in China is mainly concentrated in Sichuan and Jiangxi, accounting for nearly 74% of the nationwide total. The combined production capacity of lithium carbonate production in Jiangxi and Qinghai exceeds 50%, and over 70% if adding the third largest province in capacity.

根据主要厂商产能数据统计，目前全国氢氧化锂产能主要集中在四川和江西，二者占比全国总量近74%。江西省、青海省碳酸锂产能合计占比超过50%，产能前三省份合计占比超过70%。

**China Lithium Hydroxide Capacity**  
全国氢氧化锂产能分布



**China Lithium Carbonate Capacity**  
全国碳酸锂产能分布



Sources: SMM, CITIC Futures

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1. 锂产业流程 Lithium Industry

2. 锂冶炼技术 Lithium Extraction

3. 锂供应概况 Lithium Supply

4. 锂需求概况 Lithium Demand

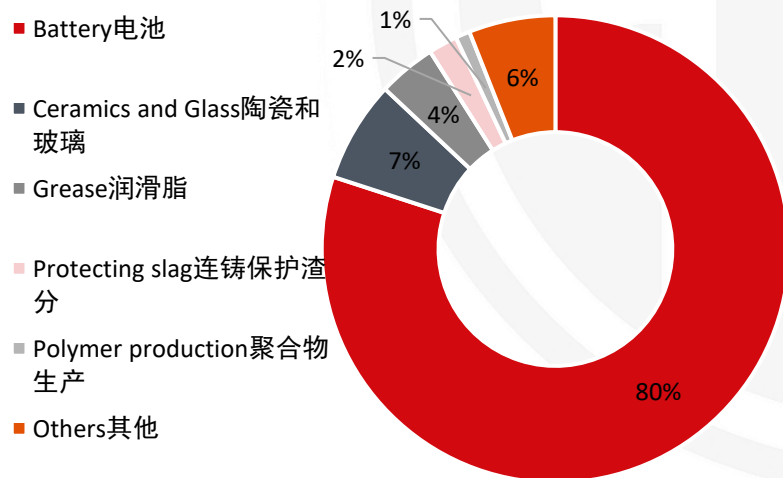
5. 锂贸易格局 Lithium Trade

# 全球锂消费结构 Global Lithium Consumption

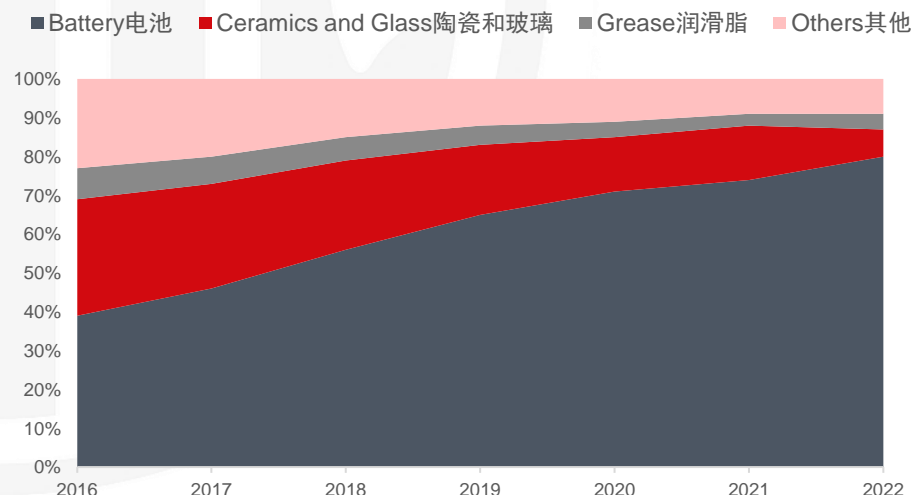
The lithium used in batteries has increased from less than 40% in 2016 to 80% in 2022. The substantial increase in sales of new energy vehicles in China has resulted in the significant increase in the demand for lithium resources and thus increasingly tight supply of lithium. China new energy vehicles' penetration has not yet reached 50%, the great potential will drive the growth of demand for lithium.

电池对锂资源的消费从2016年的不足40%提升到2022年的80%。受益我国新能源汽车产销量大增，锂资源需求大增，供给持续偏紧。我国新能源车距渗透率50%仍有差距，将推动锂需求持续增长。

**Global Lithium Consumption in 2022**  
**2022全球锂消费结构**



**Changes In Global Lithium Consumption**  
**全球锂消费结构变化**



Sources: USGS, CITIC Futures

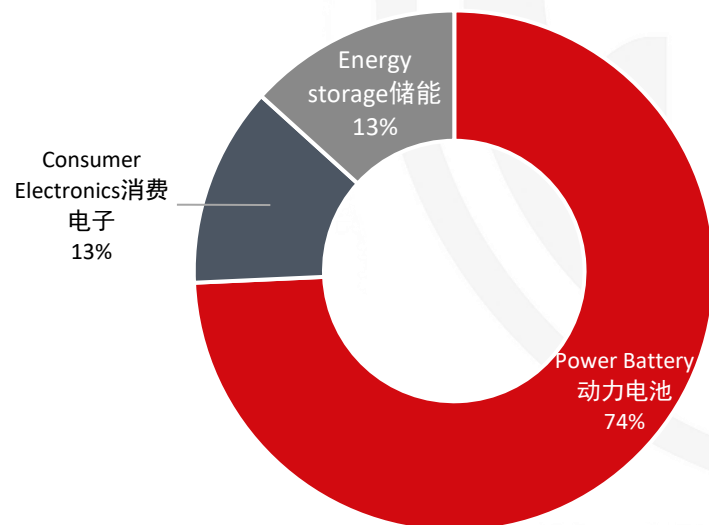
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# 全球电池消费结构 Global Lithium Consumption

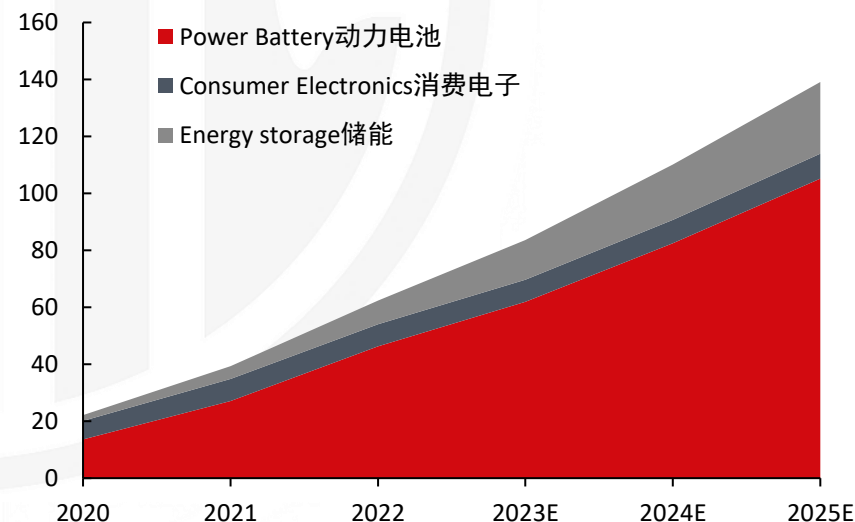
In 2022, the lithium consumption in power batteries reached the highest at 76%. The proportion of energy storage batteries is also gradually increasing, while the demand for consumer batteries is decreasing. The energy storage battery is growing even more rapidly. By 2025, the proportions of power battery and energy storage battery will be 73% and 21%, respectively.

2022年锂离子电池消费中动力电池用锂占比最高，达76%。储能电池占比也在逐渐提升，消费电子等需求占比下降。储能电池增速更快，预计到2025年，动力电池和储能需求分别占73%和21%。

Global lithium consumption structure 2022  
2022全球锂消费结构



Changes in the global lithium consumption  
全球锂消费结构变化



Sources: Huaon, CITIC Futures

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# 新能源车消费需求概况

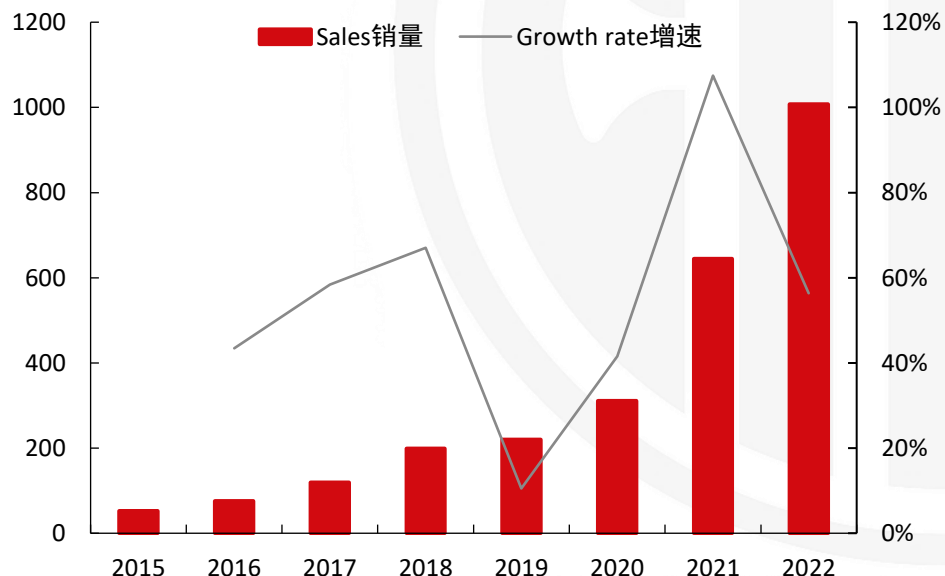
## Demand for New Energy Vehicles

Global sales of new energy vehicles reached approximately 10.07 million units in 2022. China domestic sales of new energy vehicles reached 6.9 million in 2022. Battery capacity of each vehicle is about 50 kWh, and a 1 GWh power battery would consume around 550 to 650 tons of lithium carbonate.

2022年全球新能源车销售量约1007万辆，国内新能源汽车销量688.7万辆。单辆车带电量约50 KWH，而1 GWH动力电池将耗费550吨或650吨碳酸锂。

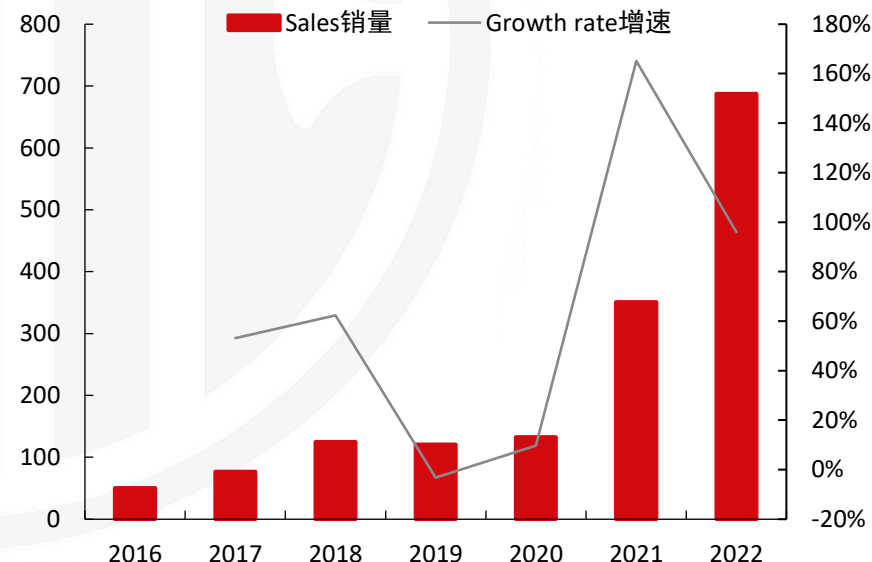
Global New Energy Vehicle Sales (10K Units)

全球新能源车消费 单位：万辆



China New Energy Vehicle Sales (10K Units)

中国新能源车消费 单位：万辆



Sources: CAAM, EV-Volumes, CITIC Futures

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# 新能源车消费需求-动力电池

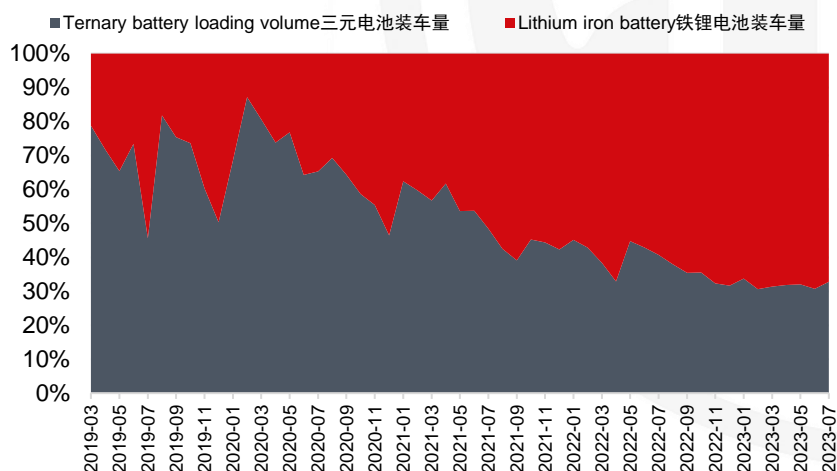
## Demand for New Energy Vehicles - Power Battery



By 2022, CATL accounted for 1/3 of the global capacity of power batteries. In China, the top 10 power battery companies by installed capacity in 2022 were CATL, BYD, SVOLT, Guoxuan High-Tech, EVE Energy, LGES, Honeycomb Energy, XINWANDA, Funeng Technology, and Microvast. The installed capacity of top 10 companies was approximately 247.64 GWh, accounting for 95% of the total.

2022年全球动力电池装机量宁德时代独占1/3。2022年国内动力电池装机量排名TOP10依次为宁德时代、比亚迪、中创新航、国轩高科、亿纬锂能、LGES、蜂巢能源、欣旺达、孚能科技、瑞浦兰钧。TOP10企业合计约为247.64GWh，占总装机量的95%。

### Power Battery Classification And Share 动力电池类别占比



### Top 10 Global Power Battery Companies 全球动力电池装机量排名

Rank 排名	Brand 品牌	2022	2021	YoY change 同比	Market share in 2022 2022年市场份额	Market share in 2021 2021年市场份额
1	CATL 宁德时代	191.6	99.5	92.50%	37.00%	33.00%
2	Igensol LG新能源	70.4	59.4	18.50%	13.60%	19.70%
3	BYD比亚迪	70.4	26.4	167.10%	13.60%	8.70%
4	Panasonic松下	38	36.3	4.60%	7.30%	12.00%
5	SK On	27.8	17.3	61.10%	5.40%	5.70%
6	Samsung SDI三星SDI	24.3	14.5	68.50%	4.70%	4.80%
7	Calb-Tech中创新航	20	8	151.60%	3.90%	2.60%
8	Gotion国轩高科	14.1	6.7	112.20%	2.70%	2.20%
9	Sunwoda欣旺达	9.2	2.6	253.20%	1.80%	0.90%
10	Farasis Energy孚能科技	7.4	2.4	215.10%	1.40%	0.80%
	Others其他	44.5	28.5	55.90%	8.60%	9.50%
	Total总计	517.9	301.5	71.80%	100.00%	100.00%

Sources: SNE Research, CITIC Futures

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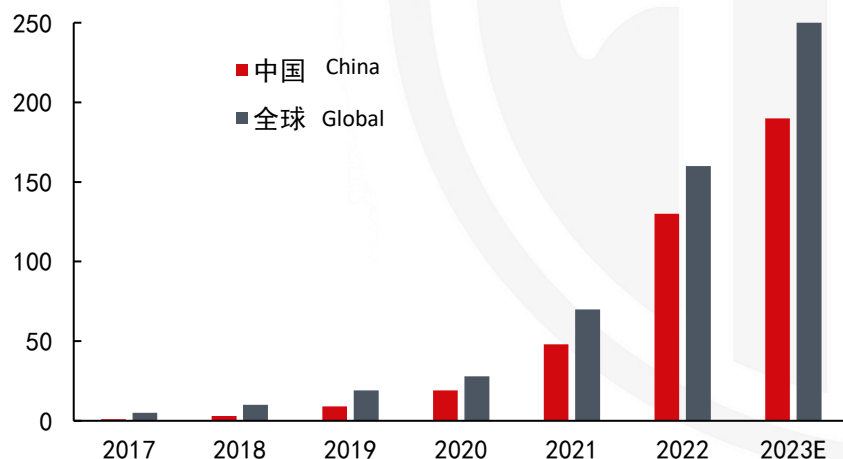


# 全球电池消费结构 Energy Storage Industry

In 2022, the shipment of energy storage batteries in China reached 130 GWh. The major players in China's energy storage battery industry include CATL and BYD. Energy storage batteries are mainly applied in new energy and energy storage, with lithium iron phosphate batteries being the main type.

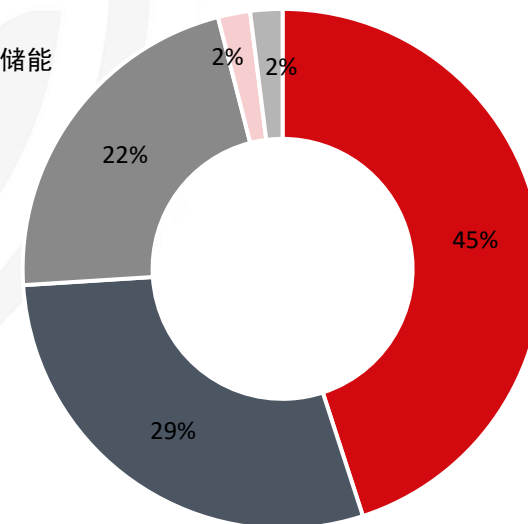
2022年中国储能电池出货量高达130GWh，同比增长高达170%。从中国储能电池主要企业包括宁德时代和比亚迪。储能主要应用于新能源+储能，以磷酸铁锂电池为主。

Global Shipments Of Energy Storage Batteries (GWh)  
全球储能电池出货量 单位：GWh



China New Electrochemical Energy Storage in 2021  
2021年中国电化学储能新增装机应用场景分布

- New energy+energy storage 新能源+储能
- Power supply side 电源侧
- Grid side 电网侧
- User side 用户侧
- Distributed Micronet 分布式微网



Sources: GGII, qianzhan.com, CITIC Futures

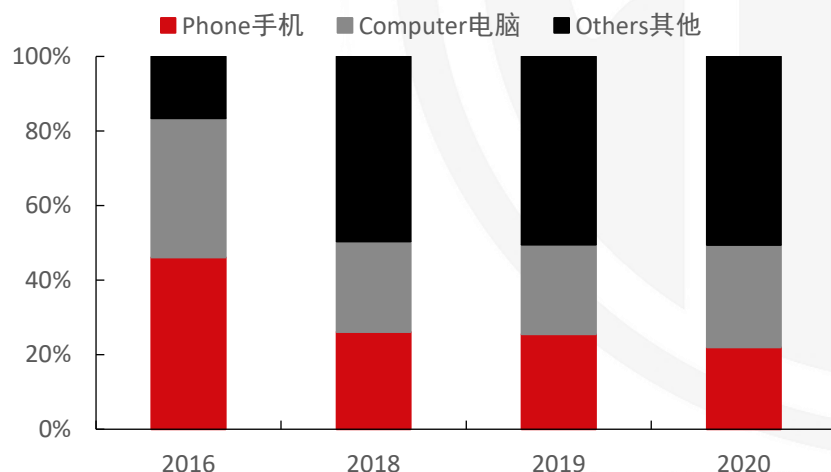
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# 消费电子需求 Consumer Electronics Demand

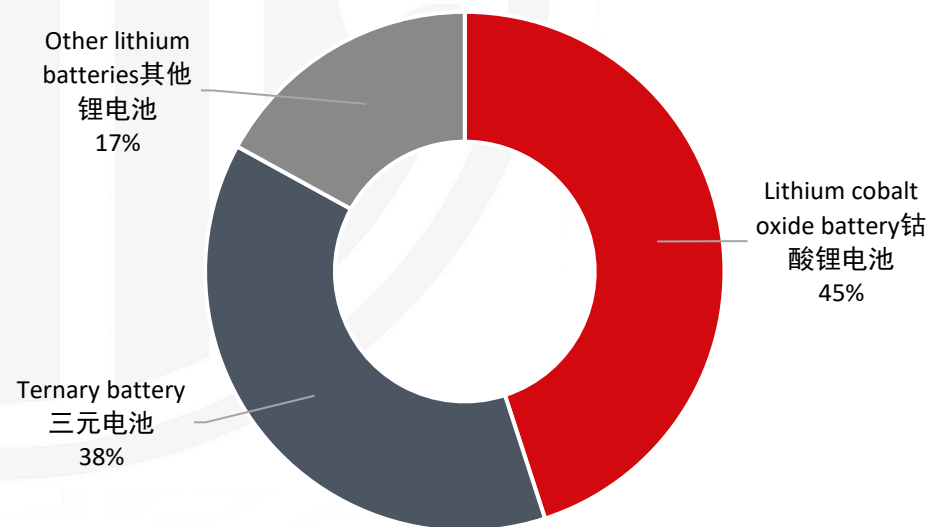
Computer, communication, consumer electronics are main sources of lithium demand. Traditional consumer electronics now dominate the consumer lithium battery market, but declining. Emerging consumer electronics products have seen an increasing shipments. Consumer electronics mainly use lithium cobalt oxide batteries, and also use other types such as ternary lithium batteries and lithium manganese batteries.

3C电子是锂的重要需求来源之一。从出货结构来看，传统消费电子锂电出货为市场主流，但呈下降趋势，而新兴消费类电子产品电池出货量占比呈上升趋势。消费电子以钴酸锂电池为主，其他包括三元锂、锰酸锂等。

**Global Consumer Lithium Battery Shipment**  
全球消费锂电出货结构



**Lithium Batteries In 3C Electronics in 2019**  
2019年各类型锂电池在3C电子应用结构



Sources: cnpowder.com, Puhua Policy, CITIC Futures

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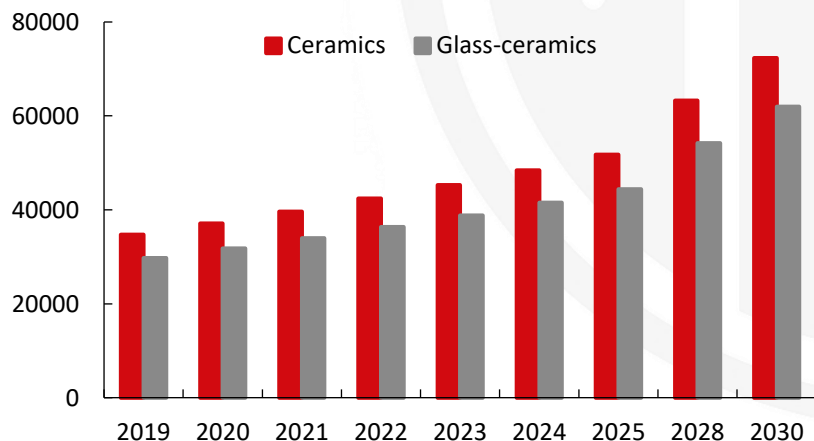
# 传统消费需求 Traditional Consumer Demand

Traditional consumer demand is mainly concentrated in the ceramic and glass industries, as well as in metallurgy, lubricants, pharmaceuticals, etc. Adding spodumene or lithium oxide to ceramics can lower the melting point and melt viscosity, simplify the production process, improve the melting quality of ceramics. The same applies to lithium in glass, especially in improving microcrystalline glass.

传统消费需求主要集中于陶瓷和玻璃行业，在冶金、润滑脂、医药等方面也有应用。在陶瓷中加入锂辉石或者氧化锂可以降低熔化温度和熔体粘度，可简化生产流程，能提高陶瓷熔化质量。在玻璃在应用有类似效果，尤其是在提高微晶玻璃性能方面起到重要作用。

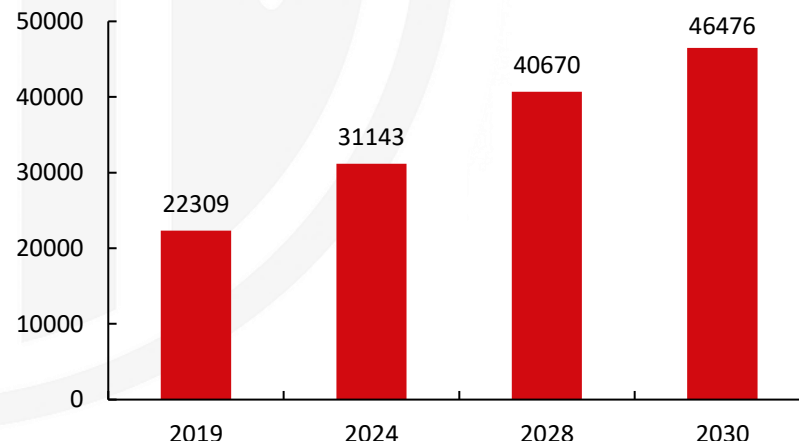
**Global Ceramic Demand For Lithium Projection (10K Tons LCE)**

全球陶瓷对锂需求预测 单位：万吨LCE



**Global Glass Demand For Lithium Projection (10K Tons LCE)**

全球玻璃对锂需求预测 单位：万吨LCE



Sources: Statista, CITIC Futures

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1. 锂产业流程 Lithium Industry

2. 锂冶炼技术 Lithium Extraction

3. 锂供应概况 Lithium Supply

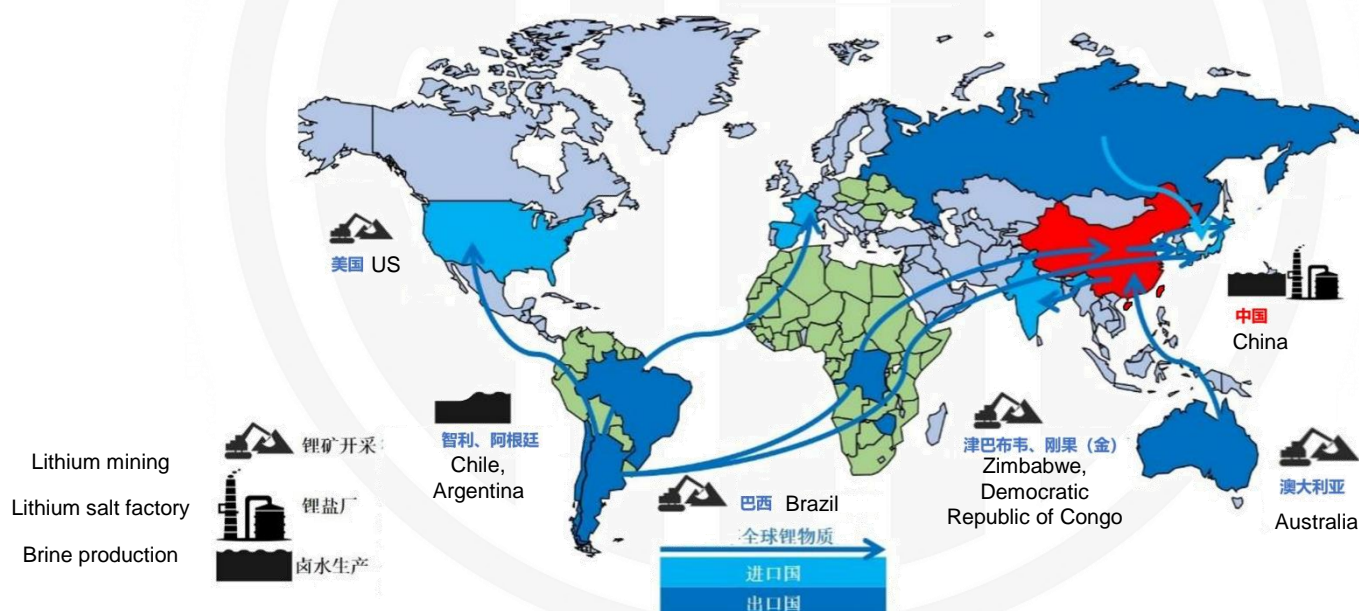
4. 锂需求概况 Lithium Demand

5. 锂贸易格局 Lithium Trade

# 全球贸易流向 Global Trade Flow

China is the main destination of lithium, while South America and Australia are the main exporters. Lithium ores are mainly exported from Australia to China, and lithium chemicals are shipped from South America. End products produced in China, Japan, and South Korea, and are sold to Europe and the US.

中国是全球锂资源主要流入国，主要流出地区为南美和澳洲。矿石主要由澳大利亚输出中国，锂化学品由南美运至世界各地，最终中日韩产出产品销往欧美。



Sources: Guangzhou Futures Exchange, CITIC Futures

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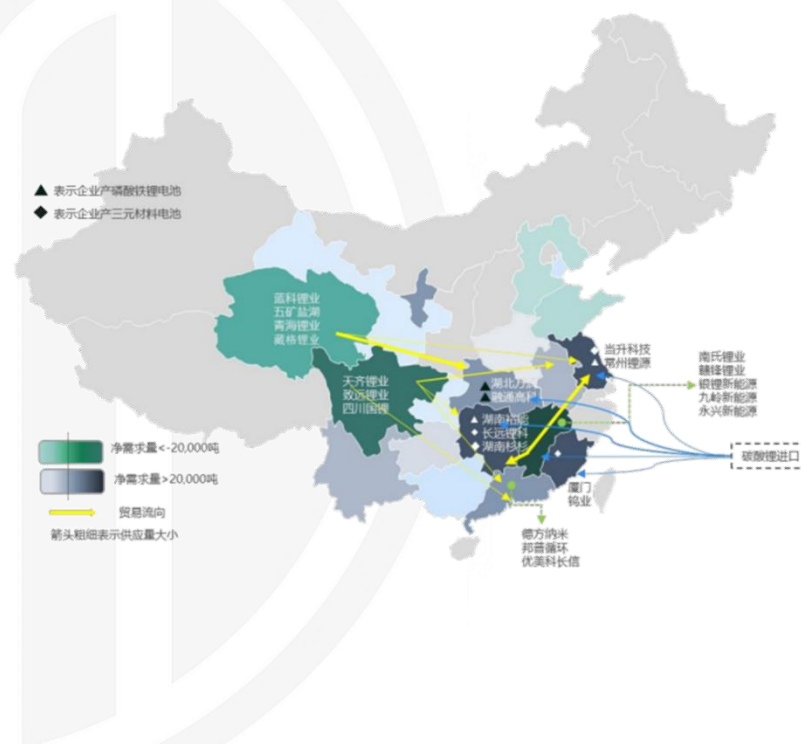
# 中国贸易流向 China Trade Flow

Lithium carbonate is mostly sold through direct selling, and domestic trade flows are mainly from manufacturing sites to consuming sites. Trade nodes and distribution centers are concentrated in the manufacturing and importing hubs.

碳酸锂多以直销模式进行销售，国内贸易流向以生产地与消费地之间直接流动为主，贸易节点和集散地集中在生产地区和进口地区。

China lithium salt trade mainly consists of three modes: loose trade with locked quantity and unlocked price (70-80%), long-term contracts with fixed quantity and price (10%), and flexible trade (10-20%).

国内锂盐贸易主要有锁量不锁价的松散型贸易（70-80%）、定量定价的长单贸易（10%）、灵活型贸易（10-20%）三种模式。





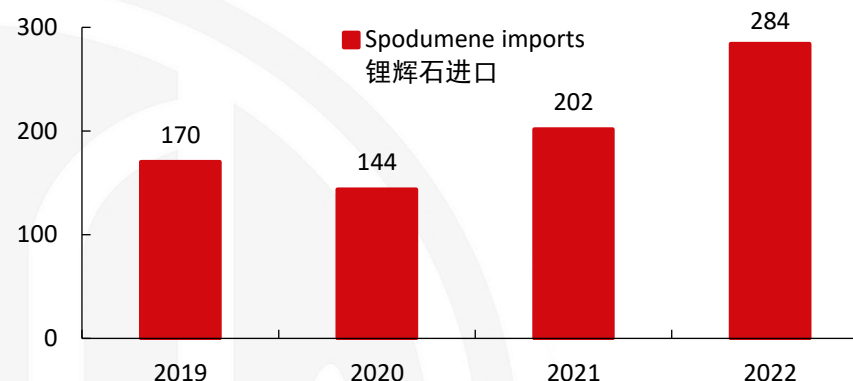
# 中国进出口格局 China Import and Export

China is a major importer of lithium ores and lithium carbonate, and also the largest exporter of lithium hydroxide.

中国是全球主要锂矿石、碳酸锂进口国，也是最大的氢氧化锂出口国。

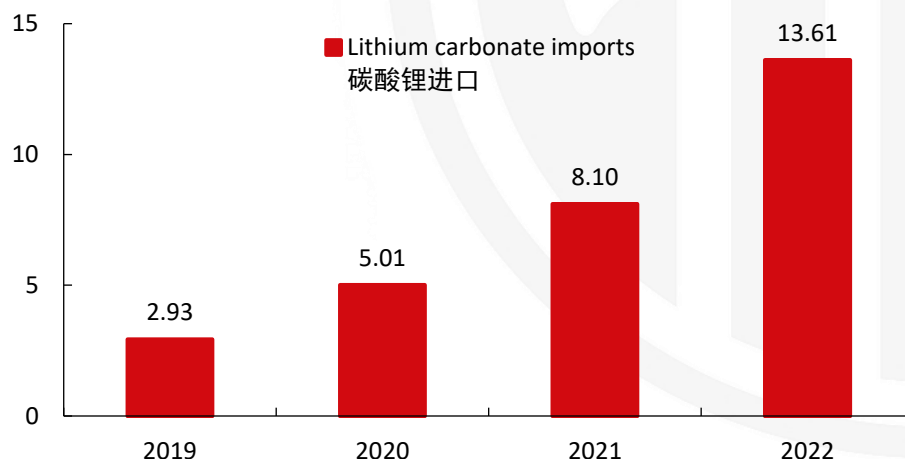
## Global Refined Lithium Market (10K Ton)

中国锂精矿进口 单位：万吨



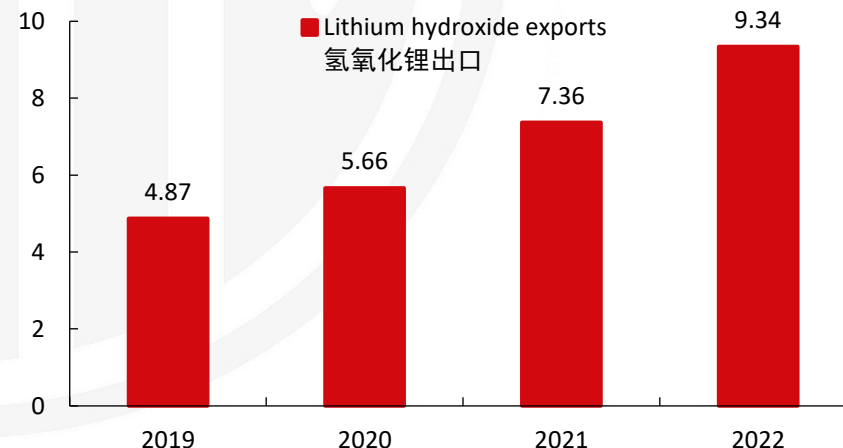
## China Lithium Carbonate Imports (10K Ton)

中国碳酸锂进口 单位：万吨



## Global Refined Lithium Market (10K Ton)

中国氢氧化锂出口 单位：万吨



Sources: SMM, GACC, CITIC Futures

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