Global and China Ternary Cathode Materials (NCA/NCM) and Battery Industry Report, 2016-2020

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STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

Abstract

Cathode materials for lithium-ion battery can be chiefly classified by material structure into three categories:
First, the laminated materials such as LiCoO2, LiNiO2, LiMO2 (M=NiCo, NiCoMn);
Second, the materials of the spinel solid, like LiMn2O4;
Third, intercalates with olivine structure such as LixMPO4 (M=Fe, Mn, Co)

The first-generation cathode material refers to lithium cobaltate (LCO) whose voltage platform is 4.2V in general and which gets mainly used in consumer electronics. As the compacted density and energy density of LCO is on the edge of extremes, there emerges the latest technology trend -- LCO mixed high-voltage compacted density NCM ternary material, to produce high voltage battery cells.

The second-generation cathode materials consist of LMO, NCM/NCA, LFP, etc., of which NCM ternary material embraces bright prospects and has been widely used in fields such as notebook computer, tablet computer, mobile phone, electric tool, electric bicycle and electric vehicle. With lower costs compared with traditional LCO, NCM tends to replace LCO in the mobile terminals field. Now in China, 85 percent of NCM ternary materials find application in mobile terminal field and among which at least 80 percent adopts cost-efficient NCM523 cathode material.

The third-generation cathode materials refer to the laminated lithium-rich manganese series materials, lithium nickel manganese oxide spinel high-voltage materials, etc. and they have not yet been massively commercialized and are the hotspot in the research of cathode materials worldwide.

The global shipment of cathode materials reached 223,400 tons in 2015, surging by 35.89% from the previous year. Thanks to brisk demand for electric vehicles, LFP and NCA show rapid growth among which NCA gets primarily used for Panasonic 18650 cylindrical batteries (to be supplied to Tesla EVs) and substantial growth of LFP benefits mainly from China's EV demand, particularly robust demand for electric buses as well as application in energy storage field.

Currently, the world's ternary material manufacturers are principally from Japan, S.Korea and China, holding a combined market share of 50% worldwide. Japanese companies are expert at technologies and have rich experience; S.Korean peers have sprung up and tend to outpace Japanese ones in both technology and quality; while Chinese counterparts that accessed into the industry late are mainly involved in the medium and low-end markets with gross margin of less than 10% and serious homogeneity of products.

At present, concentration of ternary material supply is improving in China, with four leaders including Hunan Shanshan Advanced Material, Xiamen Tungsten, Ningbo Jinhe New Materials, and Shenzhen Zhenhua New Materials together holding close to 50% market shares. In future, the market will be seized by the listed companies with strength in technology and capital.

In 2015, the shipment of NCM ternary material was up to 30,500 tons with a year-on-year surge of 45.2% in China, and the output value reported RMB3.27 billion, up 35% from a year earlier and manly spurred by growth in electric vehicles' demand for power batteries and substitution for LCO.

In addition to NCM, there is also little shipment of NCA ternary material in China, mainly contributed by Tianjin Lishen's 18650 NCA ternary lithium batteries for JAC's Iev5. Since NCA has strong chemical activity and poses exceedingly high requirements on battery thermal management system, electric vehicles in China have rare use of NCA. In 2015, the shipment of NCA ternary material approximated 2,000 tons in China.

With improvements in compacted densification, energy density, voltage, etc., ternary materials' application in the digital domain (like tablet PC and notebook computer) sees a rising proportion. What's more, the demand for ternary materials from electric tool market also keeps growing.

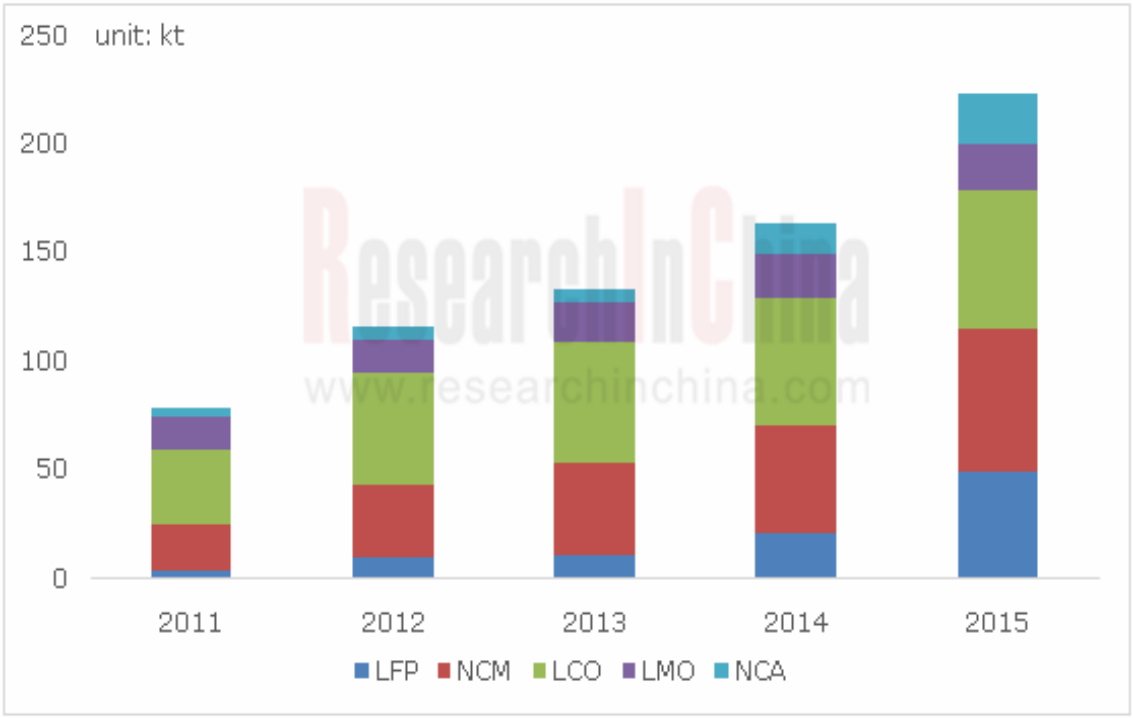
In the EV sector, the newly launched EVs in China in 2015 consisting of BAIC BJEV EV200, Chery eQ, JAC Iev4, ZOTYE Cloud 100, etc all apply ternary power batteries. According to the posed requirements on new energy vehicle innovation projects by the Ministry of Industry and Information Technology of the People's Republic of China (MIIT), in 2015, the energy density of lithium battery monomer should be not less than 180Wh/kg, the energy density of battery module is not less than 150Wh/kg, and the cycle life lasts for more than 2,000 times or ten years. Considering factors like energy density, cycle life and costs, LFP is hard to meet the new-generation lithium batteries for new energy vehicle, and the ternary cathode materials will become the mainstream technology route of cathode materials for lithium power batteries.

It is highly probable for ternary materials to replace LFP and become the mainstream cathode materials for power batteries. Only a few cathode material enterprises are capable of producing high nickel NCM622 in China. It is expected that in 2017 the penetration of ternary materials in China will be up to 20%, and till 2020 abide by 1kwh needy of 1.3kg of ternary materials, China's demand for NCM will amount to 155,000 tons and the demand for NCA ternary material will reach 8,000 tons, from which a hug rigid gap of ternary cathode materials can be seen.

As concerns technology trends, the novel lithium-rich laminated ternary materials are possible to be utilized as the cathode material for future high-energy-density lithium-ion battery due to exceedingly high specific capacity and excellent cycling competence.

Currently, first discharge of 0.1C (C stands for capacity) such material is higher than 250mAh/g and capacity retention ratio is above 90% after the cycling of thirty times, presenting remarkable electrochemical properties. The research and development of lithium-rich ternary materials is of great significance to the industrialization of power battery.

Global Shipment of Cathode Materials(LFP/NCM/LCO/LMO/NCA), 2011-2015



Source: ResearchInChina

Global and China Ternary Cathode Materials (NCA/NCM) and Battery Industry Report, 2016-2020 by ResearchInChina highlights the followings:

- Supply and demand of ternary materials in China and the world, particularly the shares of applications in such fields as new energy vehicle and consumer electronics;
- Competitive landscape in China and beyond, covering domestic and overseas companies' market share, capacity planning, market pattern, etc.;
- Technology routes and development trends of ternary materials in China and the world;
- Analysis on upstream and downstream market segments of ternary materials, consisting of cobalt metal, lithium carbonate, ternary precursor, ternary lithium battery, etc.;
- Key application growth points of ternary cathode materials, and analysis of electric vehicle industry in China and the world;
- Operation, technologies, development plans and production & sales dynamics of six manufacturers of ternary cathode materials from countries like Japan, S.Korea, Belgium and Germany;
- Operation, technologies, development plans and production & sales dynamics of fourteen Chinese ternary cathode material manufacturers;
- Operation, technologies, development plans and production & sales dynamics of seven producers of ternary lithium battery from nations such as Japan, S.Korea and Europe;
- Operation, technologies, development plans and production & sales dynamics of nine Chinese ternary lithium battery manufacturers.

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