

Li-ion Secondary Battery Key Patent Analysis : NCM Cathode Materials

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Abstracts

Drawing attention as one of main components of EVs as well as small batteries for IT devices and also aiming at the ESS market as well

As there is a growing need for high energy density batteries used as power supplies with the development of technologies for mobile devices and increase in the demand, and there has been considerable progress in research on electric vehicles to replace existing fossil fuel powered cars, active research on lithium secondary batteries as power sources is in progress.

Among components of lithium secondary batteries, cathode materials are one of very important factors determining battery capacity and performance. Although lithium cobalt oxide (LCO) is mainly used, but there are disadvantages that it is structurally instable, expensive due to limited reserves of cobalt as a raw material, and insufficient to be used as a power source of electric vehicles.

For this reason, a lot of attention is paid on the development of cathode materials to replace LCO; especially lithium nickel cobalt manganese oxide (NCM) has rapidly replaced LCO due to a lot of advantages in terms of stability, lifetime, and price. NCM cathode materials are one of main components of small batteries for IT devices. As GM's electric vehicle Volt equipped with lithium batteries using NCM cathode materials of LG Chem emerged, NCM cathode materials received intensive attention. There is brisk effort to apply NCM cathode materials in the electric storage system market wherein iron phosphate-based cathode materials are mainly used. In this situation, cathode material and secondary battery manufacturers are aggressively filing patents on NCM materials to secure their competitiveness. Although the development of NCM cathode materials was intended to replace expensive cobalt at first, it is now focused on

performance improvement, such as stability, high output, and high energy density.

SNE Report has analyzed key patents on NCM cathode materials for lithium secondary batteries. From a population of 1,429 patents on NCM cathode materials for lithium secondary cells that have been filed in Korea, the United States, Japan, and Europe until June 4, 2012, 326 effective patents were selected for the research and analysis. This report is expected to be a great help to look into the patenting trend on NCM cathode materials for lithium secondary cells and related key patents.

The patenting trend on LIB NCM cathode materials of each country 'Korea, the United State, and Japan' shows an even distribution in patent applications; an especially high level of patent applications are shown in mid 2000s in Japan, in the late 2000s in Korea, and the United States recently.

This NCM patent analysis report provides analysis of the current status of key patents, technology progress charts, and summaries of key patents filed by major applicants.

Strong Points of the report

Individual analysis of each global top applicant of patents on NCM cathode materials (9 companies)

Technology progress charts to grasp the direction of NCM cathode material development of each company

In-depth analysis of key patents

Analysis of summaries of key patents filed by applicants other than Top applicants

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