

DEVELOPMENT OF SPECIALTY PHOSPHATES FOR SMALL ALL-SOLID-STATE BATTERIES

Nippon Chemical Industrial Co., Ltd. has developed specialty phosphates that are suitable for active material and solid-state electrolyte in small all-solid-state batteries.

We have a long history of phosphorus production. In 1913, we established the first phosphorus manufacturing technology in Japan. In 1939, we succeeded in industrializing phosphoric acid by dry process. In addition, we have been manufacturing lithium-cobalt oxide, which is active cathode material for lithium-ion batteries for more than 20 years since lithium-ion batteries appeared on the market. By combining these core technologies*¹ and know-how, we have succeeded in developing specialty phosphates with performance and features suitable for small all-solid-state batteries.

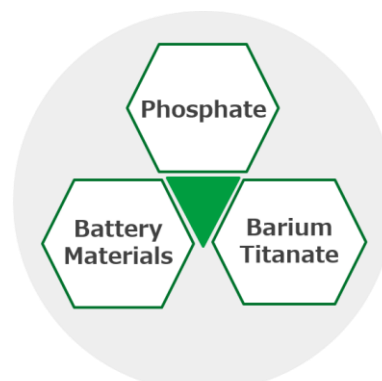
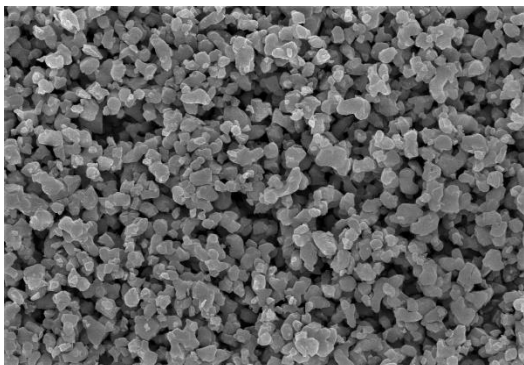
Specialty phosphates are expected to be used for small all-solid-state batteries, which are under development all over the world as next-generation batteries to replace the currently widespread lithium-ion batteries. The global market for small all-solid-state batteries is expected to approach 100 billion yen in 2030*², and furthermore, as device becomes more high-performance, multifunctional, smaller, and lighter in the future, the batteries will be required to improve all performances such as battery life, heat resistance, reliability, and safety.

Our strength in this field lies in powder control technology. Through abundant experience of powder manufacturing, we can strictly control the crystallinity and the state of material at each stage of manufacturing process. We especially aim to contribute to the further improvement of reliability and safety by stably supplying high quality to the market with our unique powder control technology.

In the future, we will continue to develop optimal materials to meet the changing market trends and plan for mass production of specialty phosphates.

All-solid-state batteries improve safety and long life, which leads to reductions of accidents and environmental impact. We will contribute to the development of the all-solid-state battery industry through the commercialization of specialty phosphates based on our company philosophy of 'Treating Humanity, Treasuring Technology with Good Care,' and continue to aim to realize a sustainable society.

◆ SEM Image



To develop specialty phosphates for small, all-solid-state batteries, we have combined each technology of; Phosphorus manufacturing know-how, which has a 100-year history, inorganic synthesis techniques cultivated in the production of active cathode material for lithium-ion batteries, and crystallinity and structure-control technologies to create uniform composition ratios at the molecular level.

*1 Core technologies are our unique know-how and technologies based on crystallinity, structure control technology, inorganic synthesis technology.

https://www.nippon-chem.co.jp/en/en_research_development/en_directivity.html

*2 Yano Research Institute, Inc., "Global Next-Generation Batteries Market: Key Research Findings 2019"