Nano One Patented Cathode Tests Positively in Solid State Batteries

written by Raj Shah | April 23, 2020
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In summary,:

- *Nano One patented cathode tests positively in solid state batteries with auto companies.*
- *Cobalt free cathode reduces supply chain risk, increases power and enables fast charging.*
- *Coated nanocrystal cathodes (single crystal) boost durability, capacity and charge rates.*

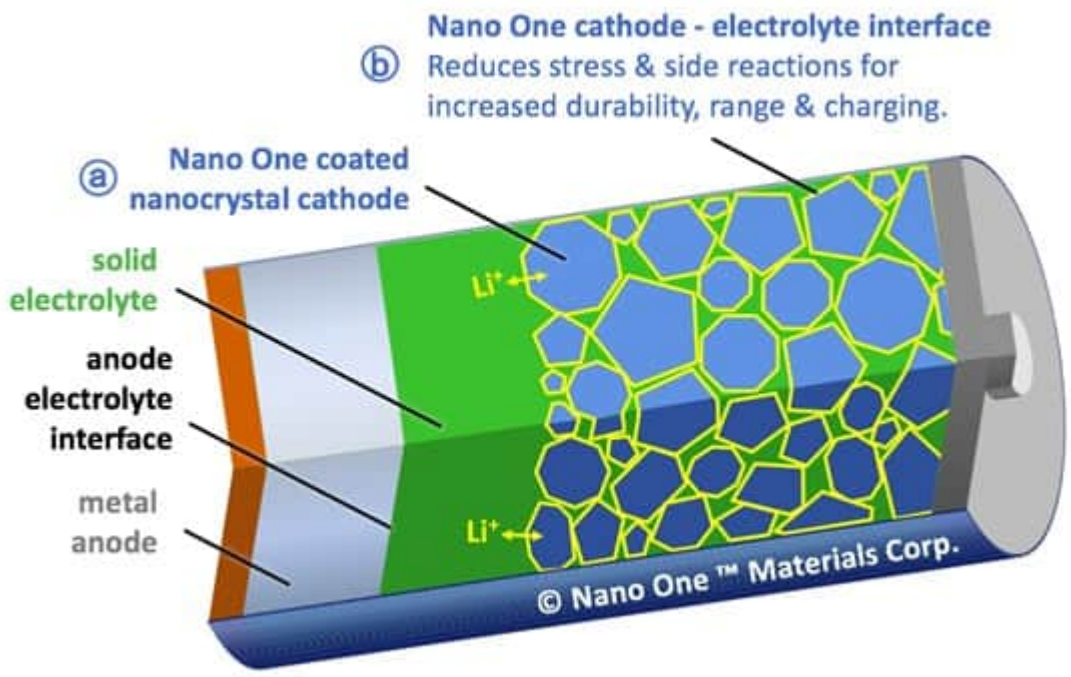

Figure 1. Illustration of a solid state lithium ion battery

showing simplified anode, cathode and electrolyte interfaces. (a) Nano One's proprietary cathode materials have a uniform coating on individual single crystal particles, enabling rapid transfer of lithium ions to the solid electrolyte while (b) protecting the cathode from expansion and side reactions as the battery is operated. This increases durability and could improve lifetime, range, charging and/or cost.

Dr. Stephen Campbell, CTO of Nano One Materials Corp., is pleased to provide an update on solid state lithium ion batteries and on related advancements to Nano One's cathode materials.

"There is a tremendous industry effort to advance and commercialize solid state batteries," explained Dr. Campbell, *"and the goal is to improve safety and performance of lithium ion batteries. The objective is to replace flammable liquid electrolytes with solid materials that improve safety, power and energy density of the battery. Nano One, with its patented technologies, is contributing to these objectives and actively working on related projects with a number of global automotive consortia."*

The largest single challenge in solid state batteries is to design a stable and commercially viable interface between the solid electrolyte, of polymer, ceramic or glass composition, and the solid cathode and anode materials on either side of this electrolyte.

Nano One is working with various automotive manufacturers to evaluate its patented One Pot process and coated lithium nickel manganese oxide (LNMO) cathode materials. The coated LNMO, also refered to as high voltage spinel (HVS), stabilizes the interface between cathode and electrolyte because (i) it does not expand and stress the cathode-electrolyte interface like

other cathode materials, and (ii) the coating protects the cathode from side-reactions with the electrolyte while allowing the rapid transfer of lithium ions between the electrolyte and the cathode. In comparison to other cathode materials, HVS is faster charging and operates at higher voltage enabling increased power and energy densities. HVS is also free of cobalt and the associated supply chain risk.

Dr. Campbell added, *"Nano One is well positioned to capitalize on the rising automotive interest in solid state lithium ion batteries. Currently, several independent evaluations of our High Voltage Spinel are underway within automotive manufacturer consortia employing both polymer and ceramic solid electrolytes. Initial results with various solid electrolytes are encouraging and Nano One will provide further details as these evaluations progress."*

Nano One Materials Corp.

Dan Blondal, CEO

About Nano One

Nano One Materials Corp has developed patented technology for the low-cost production of high performance lithium ion battery cathode materials used in electric vehicles, energy storage and consumer electronics. The processing technology enables lower cost feedstocks, simplifies production and advances performance for a wide range of cathode materials. Nano One has built a demonstration pilot plant and is partnering with global leaders in the lithium ion battery supply chain, including Pulead, Volkswagen and Saint-Gobain to advance its lithium iron phosphate (LFP), lithium nickel manganese cobalt oxide (NMC) and lithium nickel manganese oxide (LNM) cathode technologies for large growth opportunities in e-mobility and renewable energy storage applications.

Nano One's pilot and partnership activities are being funded with the assistance and support of the Government of Canada through Sustainable Development Technology Canada (SDTC) and the Automotive Supplier Innovation Program (ASIP) a program of Innovation, Science and Economic Development Canada (ISED). Nano One also receives financial support from the National Research Council of Canada Industrial Research Assistance Program (NRC-IRAP). Nano One's mission is to establish its patented technology as a leading platform for the global production of a new generation of battery materials. **www.nanoone.ca**

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