Update on Nano One's Breakthrough in Battery Longevity

written by Raj Shah | November 24, 2020

November 24, 2020 (Source) – Dr. Stephen Campbell, CTO of Nano One® Materials Corp. (TSXV: NNO) (OTC PINK: NNOMF) (FSE: LBMB) is pleased to present Nano One's latest durability test results confirming that its high-voltage cobalt-free battery is also stable at elevated operating temperatures required for automotive, power tool and energy storage applications. These results augment ambient temperature results announced on October 13, 2020 and further demonstrate the longevity and stability of Nano One's Lithium Nickel Manganese (LNM) battery system.

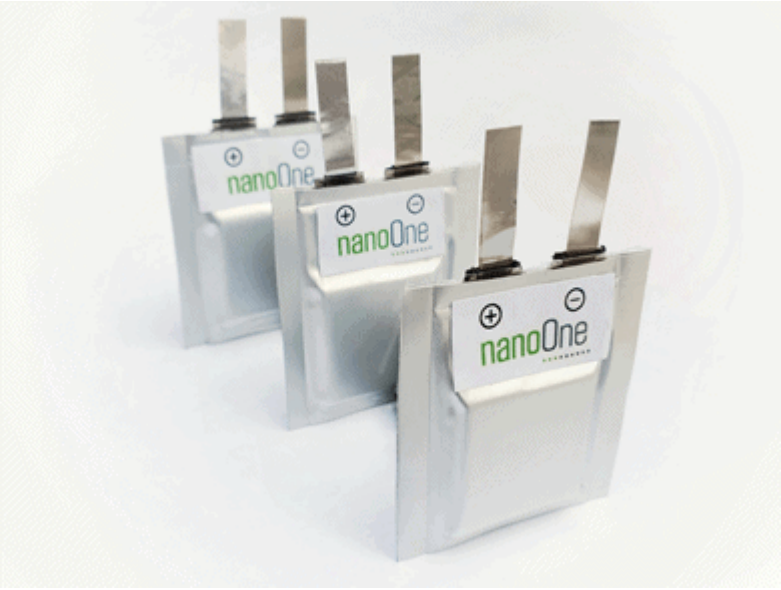
"Nano One has achieved over 500 fast charge and discharge cycles at 45°C," said Dr. Campbell, *"in an innovative battery design that pairs its high-voltage LNM cathode with a conventional electrolyte and a graphite anode. We have also reached 1000 fast charge and discharge cycles at 25°C demonstrating that issues of excessive gassing, anode contamination and poor cycling may be overcome."*

Nano One's proprietary LNM battery enables the benefits of increased voltage, elevated operating temperatures and fast charging, by eliminating failure from gassing in the first few cycles and failure from manganese contamination of the anode in the first 100 cycles.

Dr. Campbell added *"Nano One's LNM battery innovation breaks through the barriers that have hindered the commercialization of LNM cathode materials in both conventional liquid and advanced solid-state batteries."*

LNM, also known as high voltage spinel (HVS), is a cobalt-free, low-cost cathode material that operates at 4.7 volts. This voltage is 25% higher than commercial high nickel cathodes, providing improved efficiency, thermal management and power. Battery pack models suggest that LNM cathodes may reduce costs by over 30% as compared to high nickel NMC materials *[Wentker et al, Energies **12** (2019) 504-521]*.

Inspired by ESG (Environmental, Social, and Governance) concerns, the Nano One patented One Pot process combines sulfate-free feedstocks with lithium carbonate, additives and coating materials in a single reaction to, ultimately, form coated single crystal cathode materials with enhanced durability. This process further improves LNM economics and environmental sustainability by eliminating cobalt feedstock and sulfate waste and by reducing energy and water consumption.



The LNM cathode ($LiNi_{0.5}Mn_{1.5}O_4$) was tested with a graphite anode and conventional electrolyte in a 20-layer pouch cell (4.75V 126mAh 0.592Wh) charging and discharging 12 times per day for 1000 cycles at 25°C and for 500 cycles at 45°C. This demonstrates enhanced durability under operating conditions that are relevant

to automotive, power tool and energy storage applications in a cobalt-free, high voltage battery.

Nano One's LNM cathode is a leading candidate for next generation lithium-ion and solid-state batteries because its durability and dimensional stability enable a stable interface with both liquid and solid electrolytes. Several independent evaluations are currently underway within the automotive and battery supply chain demanding lower cost, higher voltage and improved safety without compromising longevity and performance.

"*Nano One has developed processes, materials and now a battery innovation to enable our novel cathode materials for the future of lithium-ion batteries*," Dr. Campbell added. "*We are excited by the commercialization and partnership opportunities of this latest breakthrough.*"

Nano One Materials Corp.

Dan Blondal, CEO

For information with respect to Nano One or the contents of this news release, please contact John Lando (President) at (604) 420-2041 or visit the website at **www.nanoone.ca**.

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 partnered with global leaders in the lithium ion battery supply chain 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), the Automotive Supplier Innovation Program (ASIP) a program of Innovation, Science and Economic Development Canada (ISED), and the Province of British Columbia through the Ministry of Energy, Mines and Petroleum Resources. 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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