NEO’s Modified CNT Nanocoating Technology Improves Life Span and Durability of Micron-Sized Metallurgical Silicon Anodes

written by Igor Makarov | July 30, 2021
July 30, 2021 (Source) – Dr. J. H. Park, Director and Chief Scientific Advisor of NEO Battery Materials Ltd. (**TSXV: NBM**) (**OTC: NBMFF**) (“**NEO**” or the “**Company**“), is pleased to provide details on NEO’s innovation utilizing modified carbon nanotubes (CNTs) as a new material to manufacture long-lasting, low-cost and mechanically durable silicon anode active materials.

CNTs are theoretically known to retain similar electrical conductivity to copper and have more than 100 times the strength of steel. In addition, conventional carbon fibers have been known to easily break at a 1% strain, but CNTs have displayed the ability to maintain its structural properties at a 15% stretching level.

Due to this capability to endure mechanical stress, CNT can act as an effective damper for the volumetric expansion problem of silicon anodes during charging and discharging cycles. Additionally, the superior electrical conductivity of the material allows the performance of the anode to be maximized. Major battery manufacturers such as LG Chemical are actively considering CNT as an additive for the next-generation battery line and are aggressively targeting to increase the production of CNTs.

NEO Modified CNT Nanocoating Technology

Despite the excellent electrical conductivity, when mixed with silicon particles, there has been difficulty maximizing the advantages of CNTs due to the lack of affinity between the two materials. NEO has thus secured the technology to functionalize the surface of CNTs and has confirmed that the surface-treated CNTs have exceptional affinity with the silicon particles. The modified CNTs can be applied as an effective material in NEO's silicon nanocoating technology.

NEO's modified CNTs can have a new morphology, and this confirms that NEO's technology enables a nanometer-scale conformal coating on the whole silicon particle surfaces. Battery characteristic analysis confirms that the life span is drastically improved compared to conventional CNTs that are applied to micron-sized metallurgical silicon anodes. With NEO's single-step, one-pot solution process, a process for mass production is currently being designed for the modified CNTs.

Electrochemical Properties		Physical Properties	
Capacity (mAh/g)	ICE (%)	Particle Size (D50, µm)	Si:CNT Ratio
3200	85 – 87%	3.0	88:12

Appointment of Dr. Min Kim as Senior Research Engineer

NEO is pleased to announce that Dr. Min Kim has been appointed as a senior research engineer for developing NEO's silicon anodes for mass production. Dr. Kim has served as a senior researcher at L&F Co., Ltd., one of the top-tier South Korean cathode suppliers in the global lithium battery supply chain. His research and experience span across both cathode, anode, and solid electrolyte materials. Dr. Kim has received his Ph.D. in Chemical Engineering from Sungkyunkwan University in 2015.

Spencer Huh, President and CEO of NEO, commented, "We are at a critical stage of scaling up NEO's proprietary nanocoating

technology to mass-produce low-cost and reliable silicon anodes. Dr. Min Kim will be an invaluable asset to the current scientific team and will help NEO accelerate its commercialization target. We will be actively bolstering our manpower to form the most effective team for NEO."

Stock Option Grant

NEO has granted 750,000 stock options to certain directors, advisors, and employees in accordance with the Company's stock option plan. The stock options have an exercise price of $1.00 per share and are valid for a 5-year period from the date of the grant.

About Dr. J. H. Park

Dr. Jong Hyeok Park is the Chief Scientific Advisor and Director of NEO Battery Materials Ltd. He has served as a Senior Researcher for LG Chem and is the co-developer of LG Chem's core innovative technology of the Safety-Reinforced Separator (SRS). Dr. Park owns a total of 92 patents related to battery technology and energy innovations. Recently, he has solely received the prestigious S-OIL 2020 Next-Generation Scientist Award in the Energy Field and was selected as one of the Top 100 Leading Scientists for Renewable Energy Technology by the Korean Academy of Science and Technology. Dr. Park is currently a Professor of Chemical and Biomolecular Engineering at Yonsei University in Seoul.

About NEO Battery Materials Ltd.

NEO Battery Materials Ltd. is a Vancouver-based resource company focused on battery metals and materials. The Company has staked new mining claims in Golden, BC, along a strike with a quartzite bed, targeting silica in the quartzites for a total of 467 hectares. NEO is also focusing on developing silicon anodes,

which provide improvements in capacity and efficiency over lithium-ion batteries using graphite in their anode materials. The Company intends to become an integrated silicon producer and anode materials supplier to the electric vehicle industry. For more information, please visit the Company's website at: https://www.neobatterymaterials.com/.

On behalf of the Board of Directors

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