Updates on Key Innovations of Licensed Patents Regarding Silicon Nano-Coating Technology for Next Generation Battery Anode Materials

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Vancouver, March 11, 2021 - NEO Battery Materials Ltd. (TSXV: NBM) ("NEO" or the "Company") is pleased to provide updates regarding the technology of the licensing agreement (the "Agreement") made with the University-Industry Foundation of Yonsei University ("Yonsei University"). NEO's innovative technology will enable ultra-fast charging and discharging, longer battery life-span, and mechanical robustness for lithium-ion batteries through proprietary silicon nano-coating.

Over the past decades, astonishing advances in portable electronics and hybrid/full electric vehicles have awakened the persistent demand for higher energy density lithium-ion batteries (LIBs) to power them longer. Due to the limited specific capacity of traditional graphite anode materials (370 mAh/g), the attractive features of silicon as an anode material - a much higher theoretical specific capacity of 4200 mAh/g, a low discharge potential of around +0.5 V versus Li/Li+, and natural abundance - have made this chemical element as one of the most promising alternatives to fulfill this demand. However, a large volume expansion/shrinkage (∼400%) of silicon during repeated lithium insertion/extraction tremendously deteriorates its cycle performance by inducing fractures both inside of Si and between Si particles, and a conductive additive or current collector can result in the loss of electronic paths and the instability of solid electrolyte interphase (SEI). These critical problems have hindered the commercial application of Si anodes in LIBs.

Several companies are attempting to solve this issue by adopting nanostructured Si-Carbon composites in various shapes of nanoparticles, nanotubes, nanowires, and their hollow or porous derivative forms to minimize the induced strain and pulverization of Si. For instance, battery manufacturing companies are now employing silicon-derivatives such as silicon suboxide (SiOx) or silicon nitride (SiNx) with much smaller specific capacities to resolve this issue. However, the main drawbacks of these solutions have been rising production costs and a low-tap density.

Figure 1

To view an enhanced version of Figure 1, please visit:
https://orders.newsfilecorp.com/files/4661/76949_3303d060141baa79_001full.jpg

Dr. Jong-Hyeok Park, Director and Chair of the Scientific Advisory Board, said, "NEO Battery Materials's nano-coating technology is able to overcome the conventional hurdles of pure silicon anode materials. Based on an all-solution process at ambient conditions with cheap elastomer ultra-thin coating layers that retain electronic and ionic conductivity, our solution processable coating technology can generate a ~2nm-thick elastomer coating layer on Si nanomaterials, minimizing the processing cost while increasing the Li-ion movement around Si anode for better battery performance."

Dr. Park has also added, "NEO's silicon has a specific capacity between 2000 mAh/g and 3000 mAh/g, depending on the types of coating layer materials. In addition, a mechanically robust and elastic, nanometer-thick coating layer on silicon nanomaterials represented a highly stable long-term cycling ability due to the uniform and reversible volume expansion with stable SEI (solid electrolyte interphase) layer. More importantly, the strong adhesive nature that originates from the nano-coating layer surrounding silicon nanomaterials is confirmed to withstand large mechanical compressive and/or tensile stresses during rigorous bending tests (more than 30,000 times of bending). This means that our new strategy will help us move forward to the realization of advanced LIBs with higher power and energy density as well as practical

futuristic flexible LIBs."

About NEO Battery Minerals Ltd.

NEO Battery Minerals Ltd. is a Vancouver-based junior resource company focused on battery metals exploration in North America. 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. The Company focuses on exploring and producing silicon, which, when added to anode materials in the production of lithium-ion batteries, provides 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/.

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