Mason Graphite Announces Testing Results for Silicon-Graphite Composite Anode Material

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MONTREAL, Nov. 01, 2021 - Mason Graphite Inc. ("Mason Graphite" or the "Company") (TSX.V: LLG; OTCQX: MGPHF) is pleased to announce that trials using Mason Graphite's Lac Gu?ret spherical purified graphite ("SPG") with silicon ("Si") additions have yielded highly promising results. This work program was originally announced in the Company's press release dated June 7th, 2021.

The work program was conducted by Sicona Battery Technologies ("Sicona"), one of Mason Graphite's strategic partners, using its patent pending process of combining Si nanoparticles, carbon, SPG and/or synthetic graphite in producing a cost effective, high performance next-generation Li-ion battery anode material.

Significant Capacity Increase for Li-ion Batteries Through Silicon Additions

Si increases the energy density of Li-ion batteries, allowing more electrical energy storage per unit of anode volume; this would, for example, translate into a longer range for electric vehicles, while using a battery similar in size. Silicon effectively displays a much higher capacity to store lithium ions, and thus energy, compared to graphite, but inevitably swells during charging, leading to important mechanical challenges.

The solution currently pursued by the industry involves small additions of Si (typically in the form of silicon-oxide "SiOx") to graphite-based anode materials upon making the electrode slurries which increases the energy density while limiting the swelling to manageable levels. This approach is however limited by the high cost of SiOx materials as well as the practical increases in energy density, long term cycling and rate capability.

The objective for the first commercial product, established through discussions by Sicona with several potential customers worldwide, is a composite anode material having an initial capacity of 450 milliamperes-hour per gram of material ("mAh/g") (Sicona "SiG450™"). This commercial grade is expected to be rapidly adopted industrially as it can be easily implemented in existing battery manufacturing processes.

Mason Graphite's SPG testing in Si-Composites

This latest series of tests was based on Sicona's proprietary formulation to produce an engineered silicon-graphite-carbon active anode material which includes a few percent of Si, carbon, and a blend of Mason Graphite's SPG and synthetic graphite. The composite anode material was then tested in prototype Li-ion batteries (half coin-cells) by Sicona in an 80:10:10 (AM:BM:CM) formulation. The highlights are:

- 435 mAh/g capacity, an increase of 19% compared to a typical capacity of 365 mAh/g for natural graphite and 22.5% increase above a typical capacity of 355 mAh/g for synthetic graphite;

  The 450 mAh/g commercial objective is expected to be easily achieved by Sicona with Mason Graphite's SPG through formulation optimization of some key parameters in upcoming tests;

- 100% coulombic efficiency after 250 cycles at various rates between 0.5C (2 hours for a full charge) to 4.6C (13 minutes for a full charge), which indicates the possibility to achieve very good long-term cycling, even after subjecting the cell to a series of faster charging rates of 1C, 2C, 3C and 4.6C;
- 100% capacity retention after >250 cycles, and this after completing a series of charging / discharging rate tests (from 10 hours for a full charge to 13 minutes for a full charge);
- Up to 96% retention capacity when increasing the cycling rate from 0.1C (10 hours for a full charge) to 1C (1 hour for a full charge) - a typical target by Korean cell producers is 90% minimum;

- 63% retention capacity when increasing the cycling rate from 1C to 3.7C (16 minutes for a full charge) and 54% retention capacity when increasing the cycling rate further up to 4.6C (13 minutes for a full charge). Importantly when returning the cell to 0.5C cycling, 100% of its original capacity (435 mAh/g) remains;
- Cycling test results are presented in the graph below. https://www.globenewswire.com/NewsRoom/AttachmentNg/c1c4dc15-8594-4ff7-9dbc-86e31affbf06

Cycling tests, which include rate variation tests, are still continuing on the same cells and optimization tests will be conducted shortly. Tests to achieve higher capacities (such as 550 mAh/g and 650 mAh/g) and full pouch cell testing are also planned in the near future.

About Sicona Battery Technologies

Sicona develops next generation battery materials technology used in the anodes (negative electrodes) of lithium-ion batteries that enable electric-mobility and storage of renewable energy. Sicona is commercializing an innovative silicon-composite battery anode technology, developed, and perfected over the last ten years at the Australian Institute for Innovative Materials (AIIM).

For more information, please visit www.siconabattery.com.

About Mason Graphite

Mason Graphite is a Canadian corporation dedicated to the production and transformation of natural graphite. Its strategy includes the development of value-added products, notably for green technologies like transport electrification. The Company also owns 100% of the rights to the Lac Gu?ret graphite deposit, one of the richest in the world. The Company is managed by an experienced team cumulating many decades of experience in graphite, covering production, sales, as well as research and development.

For more information: www.masongraphite.com

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Forward-looking information is based on assumptions management believes to be reasonable at the time such statements are made, including but not limited to, continued exploration activities, no material adverse change in metal prices, exploration and development plans proceeding in accordance with plans and such plans achieving their stated expected outcomes, receipt of required regulatory approvals, and such other assumptions and factors as set out herein. Although the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in the forward-looking information, there may be other factors that cause results not to be as anticipated, estimated or intended. There can be no assurance that such forward-looking information will prove to be accurate, as actual results and future events could differ materially from those anticipated in such forward-looking information. Such forward-looking information has been provided for the purpose of assisting investors in understanding the Company's business, operations and exploration plans and may not be appropriate for other purposes. Accordingly, readers should not place undue reliance on forward-looking information. Forward-looking information is made as of the date of this press release, and the Company does not undertake to update such forward-looking information except in accordance with applicable securities laws.

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