

# Applied Minerals, Inc. Provides Update on DRAGONITE for Use as Anode Material

10.07.2019 | [ACCESS Newswire](#)

NEW YORK, July 10, 2019 - [Applied Minerals Inc.](#) (the "Company" or "Applied Minerals") (OTCQB: AMNL), a leading global producer of halloysite clay and advanced natural iron oxides has provided the following update.

Since October 2017, the Company has been pursuing the commercialization of its DRAGONITE halloysite clay for use in lithium-ion battery technology. Academic research has demonstrated that silicon (Si) and silicon oxide (SiO<sub>x</sub>) synthesized from halloysite improve the energy storage capacity of lithium-ion batteries when used as anode material.

A leading manufacturer of lithium-ion batteries recently completed testing of SiO<sub>x</sub> material derived from the Company's DRAGONITE halloysite clay. In particular, the battery manufacturer replaced its standard SiO<sub>x</sub> material with DRAGONITE-derived SiO<sub>x</sub> as part of its current graphite/Si anode formulation in an attempt to improve performance.

Six lithium-ion battery pouch cells were created using the modified anode formulation. The pouch cells retained close to 100% charge efficiency over a 10 charge-cycle test without experiencing any energy degradation. These results, while achieved over a limited number of charge cycles, were encouraging enough to compel the battery manufacturer to continue its development work involving DRAGONITE-derived SiO<sub>x</sub>.

SiO<sub>x</sub> is derived from DRAGONITE through selectively etching a significant portion of the clay's alumina content. The resulting material has a tube-like structure. Standard Si and SiO<sub>x</sub> have approximately 10x the lithium ion absorption capacity of standard graphite-based anode material but experience significant volume expansion upon lithiation. This volume expansion adversely affects the ability of Si and SiO<sub>x</sub> to maintain its charge capacity over multiple cycles. Management believes that the tubular structure of SiO<sub>x</sub> derived from DRAGONITE reduces volume expansion upon lithiation.

We are very encouraged by these preliminary performance results of SiO<sub>x</sub> anode material derived from DRAGONITE, stated Andre Zeitoun, CEO of Applied Minerals. In particular, we believe this opportunity has a shorter path to commercialization than that of other Si-based technologies because it is focused on replacing a SiO<sub>x</sub> material currently being used by a battery producer. We believe the potential commercialization of DRAGONITE for use as anode material offers a very attractive revenue opportunity for the Company. The Company will continue to assist in the development work of the DRAGONITE-derived SiO<sub>x</sub> material and update the marketplace of any additional progress.

## About Applied Minerals

Applied Minerals is the leading producer of halloysite clay and advanced natural iron oxide solutions from its wholly owned Dragon Mine property in Utah. Halloysite is aluminosilicate clay that forms naturally occurring nanotubes. In addition to serving the traditional halloysite markets for use in technical ceramics and catalytic applications, the Company has developed niche applications that benefit from the tubular morphology of its halloysite. These applications include carriers of active ingredients in paints, coatings and building materials, environmental remediation, agricultural applications and high-performance additives and fillers for plastic composites. Applied Minerals markets its halloysite products under the DRAGONITE trade name.

From its Dragon Mine property, the Company also produces a range of ultra-pure natural iron oxides consisting of hematite and goethite. Combining ultra-high purity and consistent quality, the inherent properties of the iron oxide from the Dragon Mine allow for a wide range of end uses in pigment and technical applications. Applied Minerals markets its comprehensive line of advanced natural iron oxide

pigments under the AMIRON &#8222; trade name. Additional information on the Company can be found at [www.appliedminerals.com](http://www.appliedminerals.com) and [www.AMIRONoxides.com](http://www.AMIRONoxides.com).

#### Safe Harbor Statements

The following are safe harbor statements under the Private Securities Litigation Reform Act of 1995 for [Applied Minerals Inc.](#) Some statements contained or implied in this news release may be considered forward-looking statements, which by their nature are uncertain. Consequently, actual results could materially differ. For more detailed information concerning how risks and uncertainties could affect the Company's financial results, please refer to Applied Minerals' most recent filings with the SEC. The Company assumes no obligation to update any forward-looking information.

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<https://www.rohstoff-welt.de/news/329960--Applied-Minerals-Inc.-Provides-Update-on-DRAGONITE-for-Use-as-Anode-Material.html>

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