TRITON MINERALS LTD

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Projects:	Mozambique
Balama North	Graphite-Vanadium
Ancuabe	Graphite
Balama South	Graphite

Holder of the world's largest known.

TMG PRODUCES GRAPHENE

HIGHLIGHTS

- **Trial production of Graphene Oxide completed**
- **Graphene Oxide readily produced from different graphite concentrate grades**
- **Commercial grade Graphene Oxide produced**
- **Graphene successfully produced**
- **TMG product range expanded**

Triton Minerals Limited (ASX: TON, **Triton** or **Company**) is pleased to announce the positive initial Graphene Oxide tests conducted on the TMG concentrates.

Triton's Managing Director & CEO Brad Boyle said: *"The successful production of the Graphene Oxide and Graphene through standard industrial techniques, once again demonstrates the high quality and versatility of the TMG products.*

The remarkable properties of Graphene are well known and now that TMG has shown to be ideally suited to create the wonder material, this now creates further possibilities for Triton to expand their market presence and to explore an even broader client base and revenue streams."

GRAPHENE OXIDE

In tests conducted by a Government-sponsored laboratory in Singapore, Graphene Oxide has been successfully produced from various graphite concentrate grades of TMG product.

Commercial-grade Graphene Oxide was readily produced from a broad range of TMG concentrates, using the standard extraction methods. These initial results are considered by Triton to be encouraging.

In these industry-standard production runs only 1.5 grams of TMG concentrate was required to produce approximately 250ml of high concentration graphene oxide solution.

Research has found that graphene oxide solution is sold commercially in a diluted form (concentration at 4mg/ml) and can sell for of up to $400 for 250ml. Triton considers that the economics of producing graphene oxide and subsequently graphene from TMG are very encouraging.

The Company will continue to explore opportunities to refine the production of Graphene Oxide. As the predicted global demand for graphene oxide and graphene grows, Triton is well positioned to help meet that supply demand, with the ability to produce high purity and volume of graphite concentrate.

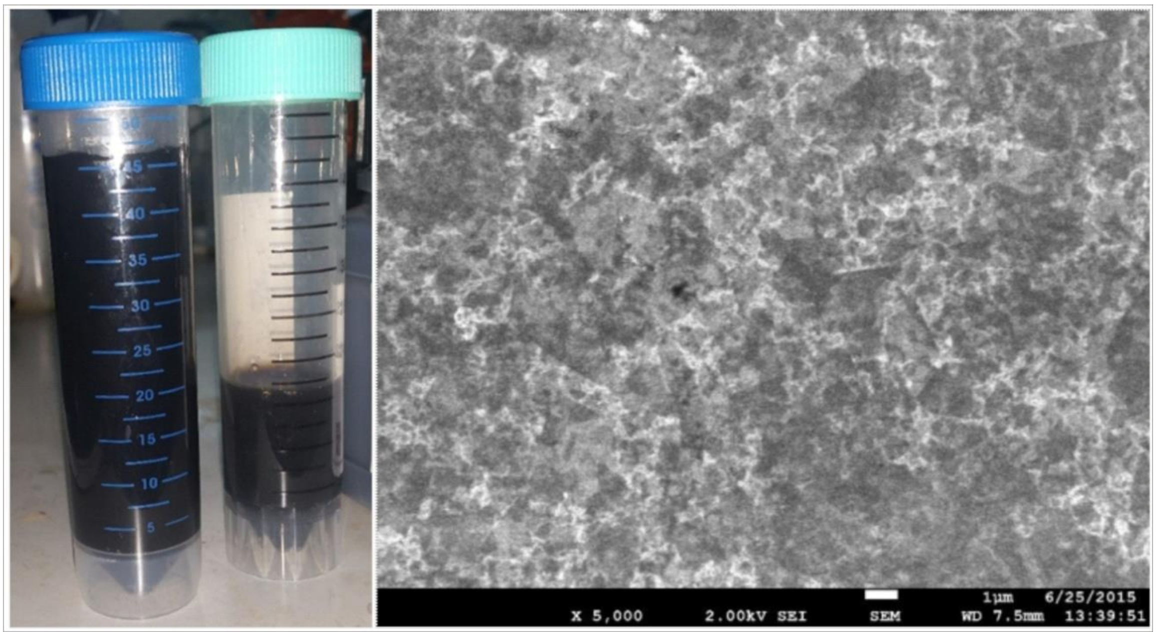

Figure 1. Image of the Graphene Oxide solution (left) created from TMG concentrates. SEM Imaging of fine Graphene Oxide flakes (right) created from TMG concentrate. The size of the flakes ranged from approximately 100 nm to 3 µm.

GRAPHENE

Triton confirms the same Singapore laboratory has also successfully created Graphene powder from the TMG products by simply reducing (drying) the TMG Graphene Oxide solution. Once the Graphene powder has been created it is actually insoluble in water.

Figure 2. Example of reduced Graphene Oxide powder (www.indiamart.com/united-nanotech/industrial-chemical.html)

WHAT IS GRAPHENE OXIDE

Graphene oxide (GO) is a unique material that can be viewed as a single monomolecular layer of graphite with various oxygen containing functionalities. Interest in GO has increased dramatically after graphene, a single layer of graphite, was first isolated and studied.

Reduced GO can be made as a thin film from an aqueous dispersion of GO in water and has moderate conductivity, it is attractive for use in electronic devices. In addition to being components in electronic devices, GO and reduced GO have been used in nanocomposite materials, polymer composite materials, energy storage, biomedical applications, catalysis, and as a surfactant with some overlaps between these fields (Source: www.sigmaaldrich.com).

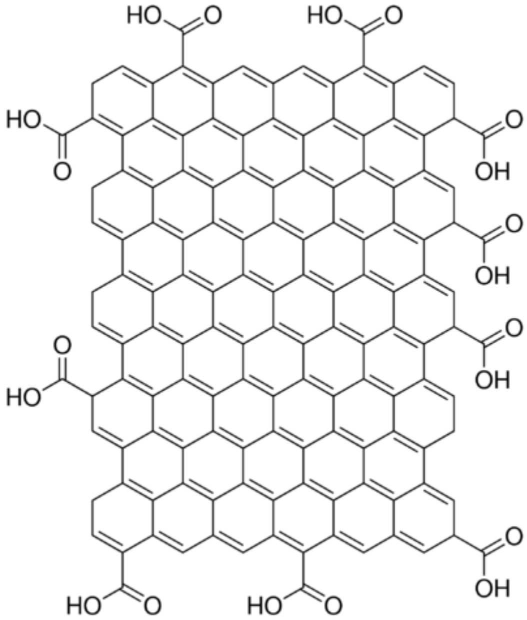

Figure 3. Graphene oxide (concentration level at 4 mg/mL, dispersion in H2O)

PROPERTIES OF GRAPHENE OXIDE

Graphene oxide is its easy dispersability in water and other organic solvents, as well as in different matrixes, due to the presence of the oxygen. The is a very important property when mixing the material with ceramic or polymer matrixes when trying to improve their electrical and mechanical properties. However, on the other hand, the electrical conductivity of GO is reduced and sometimes described as an electrical insulator, due to the bonding of the oxygen molecules (Source: www.graphenea.com).

There are many ways in which GO can be functionalized, depending on the desired application. For optoelectronics, biodevices or as a drug-delivery material, for example, it is possible to substitute amines for the organic covalent functionalization of graphene to increase the dispersability of chemically modified graphenes in organic solvents. It has also been proved that porphyrin-functionalized primary amines and fullerene-functionalized secondary amines could be attached to graphene oxide platelets, ultimately increasing nonlinear optical performance (Source: www.graphenea.com).

In order for GO to be usable as an intermediary in the creation of monolayer or few-layer graphene sheets, it is important to develop an oxidization and reduction process that is able to separate individual carbon layers and then isolate them without modifying their structure.

GRAPHENE OXIDE APPLICATIONS

There are many applications which use GO and the list continues to grow. There are many obstacles needed to be overcome before GO can be used commercially in most areas but advancements are being made every day and some of the key areas of development for GO include bioengineering, composite materials, energy technology and nanotechnology.

Energy Storage

Nanocomposites of reduced GO have been used for high capacity energy storage in lithium ion batteries. In these studies, electrically insulating metal oxide nanoparticles were adsorbed onto reduced GO to increase the performance of these materials in batteries. High surface area of reduced GO has been made using microwaves for exfoliation and reduction of GO. The high surface area reduced GO formed is useful as an energy storage material in super capacitors (Source: www.sigmaaldrich.com).

Graphene based micro-supercapacitors will likely be developed for use in low energy applications such as smart phones and portable computing devices. Graphene-enhanced lithium ion batteries could be used in much higher energy usage applications such as electrically powered vehicles, or they can be used as lithium ion batteries are now, in smartphones, laptops and tablet PCs but at significantly lower levels of size and weight (Source: www.graphenea.com).

Photovoltaic Cells

Offering very low levels of light absorption (at around 2.7% of white light) whilst also offering high electron mobility means that graphene can be used as an alternative to silicon or ITO in the manufacture of photovoltaic cells. Silicon is currently widely used in the production of photovoltaic cells, but while silicon cells are very expensive to produce, graphene based cells are potentially much less so. When materials such as silicon turn light into electricity it produces a photon for every electron produced, meaning that a lot of potential energy is lost as heat. Recently published research has proved that when graphene absorbs a photon, it actually generates multiple electrons. Also, while silicon is able to generate electricity from certain wavelength bands of light, graphene is able to work on all wavelengths, meaning that graphene has the potential to be as efficient as, if not more efficient than silicon, ITO or (also widely used) gallium arsenide. Being flexible and thin means that graphene based photovoltaic cells could be used in clothing; to help recharge your mobile phone, or even used as retro-fitted photovoltaic window screens or curtains to help power your home (Source: www.graphenea.com).

Electronics

It is predicted that Optoelectronics; specifically touchscreens, liquid crystal displays (LCD) and organic light emitting diodes (OLEDs) will soon be using GO in a commercial volumes (Source: www.graphenea.com). Other Electronic devices using GO as a starting material for at least one of the key components, including the field effect transistor (FET) that uses reduced GO as a chemical sensor and biosensor to detect hormonal catecholamine molecules, avidin and DNA. Whilst, another study had GO functionalised with glucose oxidase and deposited on an electrode was used as an electrochemical glucose sensor. (Source: www.sigmaaldrich.com).

Ultrafiltration

Another standout property of graphene is that while it allows water to pass through it, it is almost completely impervious to liquids and gases (even relatively small helium molecules). This means that graphene could be used as an ultrafiltration medium to act as a barrier between two substances. The benefit of using graphene is that it is only 1 single atom thick and can also be developed as a barrier that electronically measures strain and pressures between the 2 substances.

This could mean that graphene is developed to be used in water filtration systems, desalination systems and efficient and economically more viable biofuel creation (Source: www.graphenea.com).

Composite Materials

Graphene is strong, stiff and very light. Currently, aerospace engineers are incorporating carbon fibre into the production of aircraft as it is also very strong and light. However, graphene is much stronger whilst being also much lighter. Ultimately it is expected that graphene is utilized to create a material that can replace steel in the structure of aircraft, improving fuel efficiency, range and reducing weight. Due to its electrical conductivity, it could even be used to coat aircraft surface material to prevent electrical damage resulting from lightning strikes. In this example, the same graphene coating could also be used to measure strain rate, notifying the pilot of any changes in the stress levels that the aircraft wings are under. These characteristics can also help in the development of high strength requirement applications such as body armour for military personnel and vehicles (Source: www.graphenea.com).

Biomedical Applications

GO has been used as a component in drug delivery systems. Functionalized nanographene oxide has been used in several studies on targeted delivery of anti-cancer drugs (Source: www.sigmaaldrich.com).

Biosensors

GO and reduced GO have been used as components in several systems designed to detect biologically relevant molecules. Folic acid functionalized GO was used as a component in a system used to detect human cervical cancer and human breast cancer cells (Source: www.sigmaaldrich.com).

CONVERTING GRAPHITE TO GRAPHENE OXIDE

Triton confirms that there are many ways being developed by companies around the world to produce commercial volumes of GO and graphene, however, at the moment the most popular method to produce graphene is by using mechanical or thermal exfoliation, chemical vapour deposition (CVD), and epitaxial growth.

Many modern procedures for the synthesis of GO are based on the method first reported by Hummers in which graphite is oxidized by a solution of potassium permanganate in sulphuric acid. Reduction of GO has been reported using hydrazine, $NaBH_4$, ascorbic acid, and HI. GO can be reduced as a thin film or in an aqueous solution (Source: www.sigmaaldrich.com).

It appears the most effective way of synthesised graphene on a large scale is through chemical reduction of graphene oxide. However, it has been difficult for scientists to complete the task of producing graphene sheets of the same quality as mechanical exfoliation (Source: www.graphenea.com).

Interest in GO continues to grow as people search for a cheaper, simpler, more efficient and better yielding method of producing graphene, that can be scaled up massively compared to current methods, and be financially suitable for industrial or commercial applications. Once this issue is overcome, we can expect to see graphene become much more widely used in commercial and industrial applications (Source: www.graphenea.com).

CONCLUSIONS – What does this mean for Triton?

The demand and use of Graphene Oxide and Graphene continues to grow rapidly around the world in areas of bioengineering, composite materials, energy technology and nanotechnology. Triton has successfully produced Graphene Oxide and Graphene, using industry-standard methods, from the TMG concentrate.

This further demonstrates the high quality and versatility of the TMG concentrate products and creates further possibilities for Triton to expand their market presence and to explore a broader customer and application base and revenue stream.

Triton is rapidly working towards establishing TMG as a new global graphite-industry benchmark, by aiming to offer the world's lowest cost and most diversified graphite product range together with the longevity of a reliable supply of high quality flake graphite.

Regards

Brad Boyle
CEO & Managing Director
Triton Minerals Ltd

Holder of the world's largest known combined graphite-vanadium resource

Vision

Led by a highly experienced Board and Management team, Triton's primary vision is to grow shareholders value through discovery and development of graphite, gold and other precious, base and industrial minerals deposits. Further, Triton will explore vertical integration opportunities to supplement its core business and to create valued revenue streams to ultimately benefit Triton's shareholders.

TMG and beyond

Triton hopes to establish Triton Mozambique graphite, produced from its Mozambique graphite projects (TMG) as the global graphite-industry benchmark by aiming to offer the world's lowest cost and most diversified graphite product range, together with the longevity of a reliable supply of high quality flake graphite.

Triton hopes to establish Triton Mozambique graphite, produced from its Mozambique graphite projects (TMG) as the global graphite-industry benchmark.

Triton is also actively pursuing vertical integration opportunities to be involved in all aspects of the graphite supply chain, which Triton believes will add significant value to the Company and its shareholders in the long term.

For further information, please contact:

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Forward-Looking Statements

This document may include forward-looking statements. Forward-looking statements include, but are not necessarily limited to, statements concerning Triton Minerals Limited's planned exploration program and other statements that are not historic facts. When used in this document, the words such as "could", "plan", "estimate" "expect", "intend", "may", "potential", "should" and similar expressions are forward-looking statements. Although Triton Minerals Limited believes that its expectations reflected in these are reasonable, such statements involve risks and uncertainties, and no assurance can be given that actual results will be consistent with these forward-looking statements.