MRL Corporation Ltd

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Tests Show Very High Graphene Yields

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ASX Symbol
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HIGHLIGHTS

- Graphene Yield percentage (from exfoliated portion of graphite) in excess of 90%.
- Graphene Yield percentage (from total graphite) was in excess of 43.6%. With optimisation MRL anticipates the total yield to approach the TGC of the graphite.
- These results from a leading Australian university are particularly exciting as the tests are preliminary in nature and expected to improve with optimisation.
- The process is extremely quick with graphene produced and completed within ten (10) minutes.

Following on from the ASX release of 13 May 2015, in which the Company disclosed it had achieved outstanding results on the recovery of graphene from MRL's high-grade graphite ore, the directors are pleased to announce further test work has indicated the Sri Lankan graphite provides a very high graphene yield.

With an exfoliation process time of only 10 minutes, 50% of graphite is exfoliated and gave a graphene yield of >90%. The yield calculation of electrochemically exfoliated graphene from MRL's graphite will be optimised in future proposed studies.

While MRL is of the view that its high grade graphite ore has a ready market at premium prices, these latest test results suggest that MRL should also be positioning itself as a significant, low cost supplier of graphene to the market. The very high yields being experienced - much higher than any other company has achieved - place the company in a very favourable competitive position

Craig McGuckin said "The result is extremely exciting considering the speed of graphene conversion and yield of >90% when compared to conversion rates of 2% to 12% reported by other listed graphite companies."

While further test work will be undertaken to optimise the process and the yield the implications of this initial test are significant. The short time frame and low voltage and amperage, yet still significant yields, mean MRL will be looking at achieving high levels of graphene production from low volumes of graphite ore.

MRL's graphite projects in Sri Lanka have very high grade vein ore, with analysis of drilling core showing a range of 92.8 to 99.3% TGC [i]. Such high grades and excellent yield results will minimise the capital expenditure required to become a supplier of graphene to the market.

Electrochemical Method

The electrochemical method has been used for the production of graphene from raw graphite.

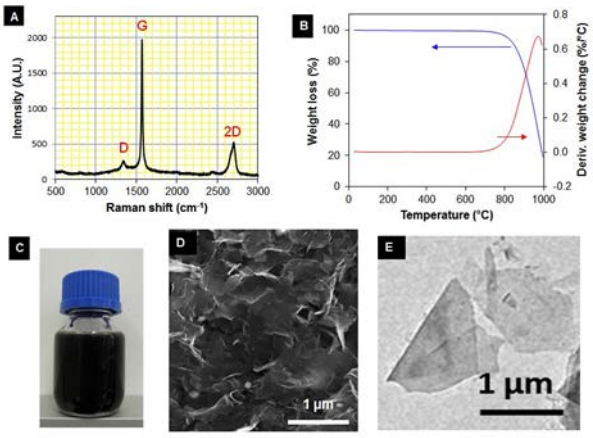

Figure 1 a-b) Raman and TGA spectra of graphene, c) Graphene solution, d) SEM, and e) TEM images of the graphene sheets electrochemically removed from the process.

Graphene was successfully extracted from raw MRL graphite using direct electrochemical exfoliation without having to purify the material. The quality of graphene (single to several layer thickness and low defects) prepared by this method is comparable with graphene prepared by synthetic method.

Figure 2 *Graphene powder produced from MRL graphite*

Graphene *Solution produced from MRL graphite*

About MRL Corporation Ltd (ASX: MRF)

MRL is aiming to develop an underground mining operation to extract high-grade, crystalline vein graphite, which is unique to Sri Lanka. The Company holds exclusive rights to exploration licenses covering approximately 6,300 hectares in area, with historical workings located within nearly all license grids.

About Graphene

Graphene, the well-publicised and now famous two-dimensional carbon allotrope, is as versatile a material as any discovered on Earth. Its amazing properties as the lightest and strongest material, compared with its ability to conduct heat and electricity better than anything else, mean it can be integrated into a huge number of applications. Initially this will mean graphene is used to help improve the performance and efficiency of current materials and substances, but in the future it will also be developed in conjunction with other two-dimensional (2D) crystals to create some even more amazing compounds to suit an even wider range of applications.

One area of research which is being very highly studied is energy storage. Currently, scientists are working on enhancing the capabilities of lithium ion batteries (by incorporating graphene as an anode) to offer much higher storage capacities with much better longevity and charge rate. Also, graphene is being studied and developed to be used in the manufacture of supercapacitors which are able to be charged very quickly, yet also be able to store a large amount of electricity.

About Graphite

Natural graphite occurs in three forms: amorphous graphite, flake graphite and the most rare and highest quality form being crystalline vein graphite. Sri Lanka is famed for being the only commercial producer of crystalline vein graphite (lump or Ceylon graphite), the highest quality of naturally occurring material in the world. The quality of vein graphite produced in the country has a purity level in excess of 90% TGC (Carbon as graphite) which means little upgrading and processing is required to make a high quality saleable product.

Vein (crystalline) graphite is the purest form of graphite with TGC grades typically >90%, with some grade as high as 99.5% TGC. Mining vein graphite may be considered analogous to high-grade gold vein mining, requiring considerably less capital expenditure when compared to large-scale open pit mining. That is, development, mining equipment and processing plants will be of a significantly smaller scale. Operating unit costs will also be lower than those for typical large-scale open pit mining.

Nature of vein graphite

Sri Lankan graphite deposition model is best described from the 'bottom up': tension fractures formed in the metamorphic sediments, caused by the folding of the sediments, creating 'conduits' for the hydrothermal deposition of high quality vein graphite. Historically, mining of these veins has found the veins generally increase in thickness and grade quality with increasing depth. Graphite veins generally dip steeply at –70° to near vertical, enabling 'narrow vein' extraction mining techniques similar to those used on narrow vein, high-grade gold deposits. The method commonly used is an overhead retreat stoping technique where the high-grade vein graphite is mined and hauled to surface without contamination. The graphite selvages, in contact with the surrounding waste, is hauled to surface and stockpiled for upgrading. The balance of the waste is used to fill the floor of the stope.

Due to the nature of the vein graphite, it is anticipated vein widths of ~25cm, using narrow vein mining techniques can be economically extracted from underground operations.

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[i] ASX Announcements 17 July 2014 & 28 January 2015