

Graphite & Graphene Weekly Review: The Contest for Graphene begins

✘ The biggest news in graphite last week was all related to its graphene derivative. Graphene has been known to exist for well over a century. It is essentially a form of graphite oxide and graphite oxide sheets (that have since been named graphene oxide) were discovered as a result of graphite chemical exfoliation experiments in the late 1800's. However, it has not been until the past few years – since the 2010 Nobel Prize for Physics was awarded to two researchers at the University of Manchester who have worked extensively with graphene – that graphene's multi-faceted potential has been discovered. So far graphene has been touted as nothing short of a miracle material: such attributes as “the strongest material known, the most flexible, the most versatile” are among the most common cited. Nevertheless, for all the enthusiasm, the actual benefit to industry deriving from graphene is low.

This may be about to change. The European Union has awarded a one billion Euro contract to Nokia and some partners to study the material and develop some practical applications. Nokia has been given the tools to effectively challenge Samsung in South Korea, which had already set up a special graphene research unit. The resulting competition among electronics giants would generate the necessary critical mass to generate much more demand for graphene, one might call it a new technological or industrial ‘revolution’ in the same sense that silicon radically changed technology in the 1970's and 80's. As a result, demand for high quality flake graphite can only increase given the multitude of applications that have been conceived already.

Researchers at Nokia, and no doubt elsewhere, will now be in a better position to evaluate just where and how graphene can be most useful and practical; it may start replacing other materials in existing products even while turning the wildest technological and scientific fantasies into reality. Indeed, the fact that such mainstream publications as the Financial Times are running articles about graphene shows how far the material has come along from 'science fiction' to science fact. While the article warned against being overly optimistic, suggesting there "is too much hype" over graphene, the fact of the matter is that new applications are being discovered every day and methods for getting graphene into high volume production are also progressing thanks to efforts of companies such as Grafoid Inc., a 40% owned subsidiary of Focus Graphite (TSX: FMS; OTCQX: FCSMF).

Recent research in graphene, moreover, as noted by ProEdgeWire, has shown that graphene can absorb water. Apart from the fact that this could lead to the development of special applications where impermeability is crucial, it means that graphene could be used in complicated chemical processing. One possibility of interest is in the rare earths space. Rice University and Lomonosov Moscow State University have collaborated in studying the ability of graphene platelets to absorb radioactive particles of water.

This characteristic would allow for more efficient processing of rare earth minerals, which often contain thorium, uranium or both. This phenomenon could be brought to commercial maturity and have tremendous impact in helping to clean up contaminated sites and in general mining, as well as rare earth mining. However, rare earth mining would be the most to benefit, and the more efficient purification process would facilitate the establishment of more rare earth mines in areas beyond China. Such ProEdgeWire sponsors as Focus Graphite, Zenyatta Ventures (TSXV: ZEN) or Galaxy Graphite (TSXV: GSX), Standard Graphite Corp. (TSXV: SGH; OTCQX: DARDF) are mining

in some of the best graphite mineralization zones – eastern Ontario and western Quebec – in the world for the production of graphene. Raw graphite, after all, can be found in many parts of the world, but not all of it is of the right quality or variety suitable for graphene. Flinders Resources Ltd. (TSXV. FDR), for example, has a graphite project in Sweden with some advantages and a mineralization suitable for graphene production. Those companies producing quality graphite are best positioned to take full advantage of the new market interest in graphite. As for share performance, last week was rather stable as the average movement for the ProEdgeWire Graphite and Graphene was 3.07%. At the time of writing, Zenyatta, in particular, announced a second series of beneficiation tests of its vein or Sri Lankan graphite variety, achieving a 99.96% purity level.

The following are the monthly share price changes for January 2013:

