

9th June 2021

University of Adelaide confirms quality of PureGRAPH® for advanced functionalisation

HIGHLIGHTS

- **Adelaide University has developed an efficient and scalable process to further functionalise PureGRAPH® platelets**
- **Advanced functionalised PureGRAPH® will improve dispersibility and performance of graphene enhanced systems, opening up a wider range of markets to First Graphene**
- **The researchers confirmed that First Graphene's PureGRAPH® products are pristine, low-defect, few-layer graphene platelets**
- **Detailed assessment available in scientific paper published by University of Adelaide**

First Graphene Limited (ASX:FGR; "First Graphene" or "the Company") is pleased to announce the publication of a scientific paper written by researchers at the University of Adelaide, which describes a "green" process to improve the compatibility of First Graphene's PureGRAPH® materials in a range of systems.

The paper, titled *Highly Water Dispersible Functionalised Graphene by Thermal Thiol-ene Click Chemistry*, was written by a team of world-leading researchers led by Professor Dusan Losic, leader of the Nano Research Group at The University of Adelaide and Director of ARC Graphene Research Hub. It has been peer reviewed and was published on 25th May 2021 in science and engineering journal *Materials*.

The researchers successfully "functionalised" PureGRAPH® graphene supplied by First Graphene. The functionalisation process involves chemically bonding molecules to graphene platelets. One end of the molecule will bond to the graphene surface and the other free end interacts with the medium that the graphene is added into. This improves the level of dispersion and interaction of the graphene platelets with the medium, further enhancing its properties and improving its dispersion in other composite systems such as polymers and rubbers. PureGRAPH® has a broad range of applications which can be further expanded by adding additional finishing steps, generally referred to as functionalising. The process is shown in Figure 1.

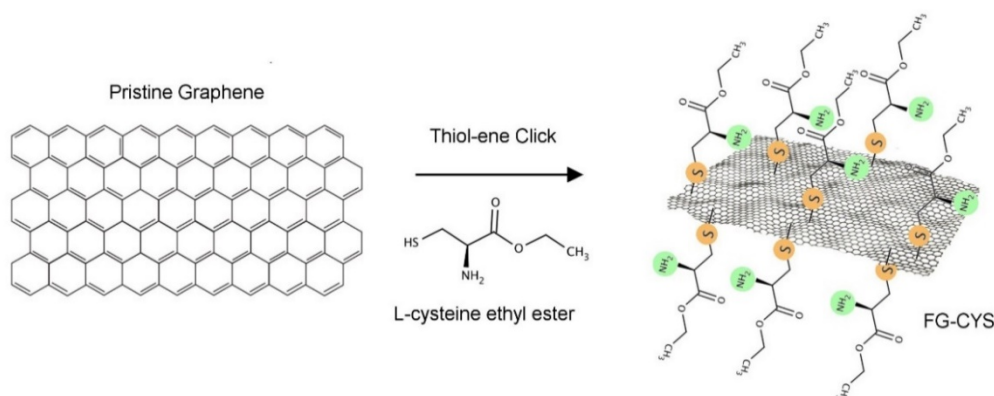


Figure 1: Representation of the functionalisation process (first published in Materials 2021, 14, 2830)

As part of the ARC Graphene Research Hub Program, of which First Graphene is a founding partner, Professor Losic's team has also confirmed the pristine nature of PureGRAPH®. The team used advanced analytical techniques to show that commercially available PureGRAPH® platelets have a typical average thickness of six layers, confirming the product is a Few Layer Graphene (FLG).

First Graphene is now actively working with the research team at the University of Adelaide to scale up the process and enable First Graphene to extend applications for its product range, increasing usability options for end customers and ultimately driving greater demand for PureGRAPH®.

Background to Functionalisation of Graphene

Graphene is an advanced 2D nanomaterial that has the potential to be added to a vast array of products and applications to deliver significant improvement in performance across that range of materials. Once the graphene has been made in the first instance, many of the intended applications require extra finishing steps (functionalisation) in order to maximise the benefits of the added graphene i.e. it needs to be optimised for specific client specifications.

In the context of this announcement, the work by the University of Adelaide has confirmed the suitability of PureGRAPH® to its use with its recently designed functionalisation methodology. This addresses the hydrophobic characteristic of pristine graphene, thereby potentially opening additional market opportunities to First Graphene.

Michael Bell, Chief Executive Officer of First Graphene said: "We are excited by the outcome of the research carried out by the team at the University of Adelaide. This has the potential for us to further extend our product offering to our customers, and therefore accelerate the uptake and demand for PureGRAPH®. We look forward to working with Professor Losic's team to further this work and potentially develop a range of new products."

ASX ANNOUNCEMENT



Professor Dusan Losic, leader of the Nano Research Group at the University of Adelaide, said: "We are very pleased to continue working with First Graphene's pristine graphene platelets. The results of our work are very encouraging, significantly enhancing their potential to be applied to a wide range of end applications. We found the PureGRAPH® materials to be ideally suited to this chemistry with large size, low-defects, few-layer, pristine platelets that have some oxygen-edge functionality on receipt."

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About First Graphene Ltd (ASX: FGR)

First Graphene Ltd. is the leading supplier of high-performing, graphene products. The company has a robust manufacturing platform based upon captive supply of high-purity raw materials and an established 100 tonne/year graphene production capacity. Commercial applications are now being progressed in composites, elastomers, fire retardancy, construction and energy storage.

First Graphene Ltd. is publicly listed in Australia (ASX:FGR) and has a primary manufacturing base in Henderson, near Perth, WA. The company is incorporated in the UK as First Graphene (UK) Ltd. and is a Tier 1 partner at the Graphene Engineering and Innovation Centre (GEIC), Manchester, UK.

PureGRAPH® Range of Products

PureGRAPH® graphene powders and **PureGRAPH® AQUA** pastes are available in tonnage volumes with lateral platelet sizes of 50µm, 20µm, 10µm and 5µm. The products are high performing additives, characterised by their high quality and ease of use.

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With authority of the board, this announcement has been authorised for release by Aditya Asthana, Chief Financial Officer and Company Secretary.