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ASX Announcement (ASX:**AXE**) 23 July 2018

Archer graphite a versatile graphene feedstock

Highlights

- Work with The University of Adelaide and FlexeGRAPH has showed a number of different processes can be utilised for Archer's Campoona graphite to produce graphene and graphene-based products.
- Graphene materials were produced with high yields, purity, and scale-up potential suitable for use in reliable energy, human health, and quantum technology applications.
- Graphene powders, dispersions, and graphene oxide products prepared to target major segments in the graphene technology market, which is expected to grow to US$70 billion by 2030[1].
- The results of the work will now be used to commercially translate products in areas relating to high volume and high value graphite-to-graphene development.

Archer Exploration Limited (ASX:AXE, Archer) is pleased to announce the following results of the independent collaborations between Archer and The University of Adelaide and Flex-G Pty. Ltd (FlexeGRAPH) with respect to the preparation of graphene-based material products derived from Archer's Campoona graphite deposit. The versatility of the Campoona graphite was demonstrated by preparing the graphene materials using a number of different approaches, including publicly available and proprietary methods.

The University of Adelaide successfully prepared graphene materials from Archer's Campoona graphite, which included graphene powder and graphene oxide, using established, publicly available chemical and mechanical exfoliation processes. FlexeGRAPH successfully prepared a water-based graphene material dispersion using proprietary methodology involving surfactant assisted exfoliation.

The graphene materials, properties, and quality were verified by technical analysis undertaken by Archer at the world-class Australian Centre for Microscopy & Microanalysis at The University of Sydney and The University of New South Wales Mark Wainwright Analytical Centre.

The results of the technical analysis confirmed that the graphite from the Campoona deposit could be used to produce multiple graphene-based products from a number of different methods, which is critical for value-add applications and high-quality graphene production using graphitic feedstocks in the targeted areas of reliable energy, human health, and quantum technology.

The technical analysis included the use of a JEOL 3000F Transmission Electron Microscope (TEM) to perform Select Area Electron Diffraction down to nanoscales of representative regions of the samples, verifying the presence of individual atomically thin layers of graphene, and the structural integrity and high quality of the materials produced (Fig. 1).

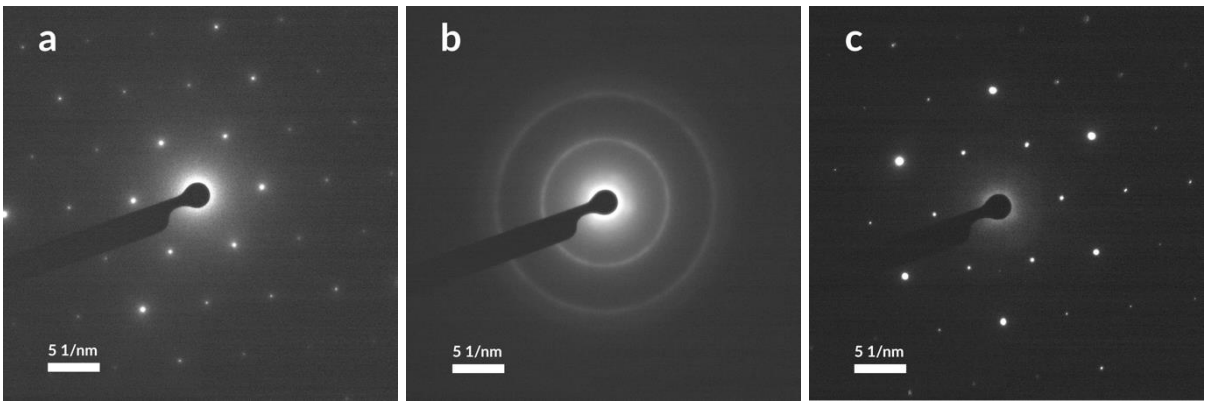

Fig. 1. Select area electron diffraction of (a) graphene and (b) graphene oxide produced with The University of Adelaide, and (c) graphene produced with FlexeGRAPH. The images (a) and (c) show the typical 'hexagonal spot' patterns that appear from the diffraction of the TEM beam when it strikes perpendicular to a graphene material lattice. By using tilt, and rotating the detection through a suitable angle, single layers were confirmed by the absence of diffraction spots that correspond to inter-layer graphitic correlations. The pattern obtained for graphene oxide in (b) is expectedly diffuse and corresponds to the presence of oxidised layers of graphenic material.

Archer CEO Dr Mohammad Choucair commented, "We are confident in our capability to provide high-quality graphite that is process agnostic in the production of graphene. Regardless of avenue taken, our Campoona graphite resulted in graphene materials that demonstrate the structural integrity suitable for high value applications. The work with The University of Adelaide and FlexeGRAPH highlights our continued and successful collaborative efforts, and provides Archer with commercial opportunities to develop high-value graphene integration solutions in an emerging and growing graphene materials market."

Background:

Market Summary

Graphene materials and technology are emerging with the potential to broadly impact existing markets that service the electronics and additive manufacturing industries. Graphene material sales and device integration are expected to form part of the market value potential of approximately US$70 billion by 2030[1]. The main challenge to widespread adoption of

graphene materials has been in developing high-volume and high-value integrated devices and technologies that can be efficiently and effectively scaled. Potential solutions to the graphene adoption bottleneck include utilising a combination of the material's unique quantum and chemical properties for use as critical componentry, with the advanced material technology function expected to determine subsequent pricing.

The University of Adelaide

Archer is engaged in a collaboration agreement with The University of Adelaide as part of the Australian Research Council Research Hub for Graphene Enabled Industry Transformation. The collaboration seeks to target high value, high growth markets servicing human health applications by developing and implement graphene and carbon-based materials for use in complex biosensing devices.

FlexeGRAPH

Archer is engaged in a collaboration agreement with FlexeGRAPH to develop graphite and graphene advanced materials for thermal applications. FlexeGRAPH was founded in Australia in 2017 and produces graphene-based materials for electrified systems such as batteries and high-performance computing and data centres. The core technology was developed at the Australian National University and has been patented and exclusively licenced to FlexeGRAPH.

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For more information visit our website
https://archerx.com.au/investors/

[1] Batra, G. Santhanam, N. Surana, K. Graphene: The next S-curve for semiconductors? McKinsey&Company, **April 2018**. Date accessed: 23 July 2018. https://www.mckinsey.com/industries/semiconductors/our-insights/graphene-the-next-s-curve-for-semiconductors