

Independent University Research Confirms and Quantifies Ease of Conversion of ZEN Graphene's Albany Pure(TM) Graphite to Graphene

written by Raj Shah | August 6, 2020

August 6, 2020 ([Source](#)) – **ZEN Graphene Solutions Ltd.** (TSXV: ZEN) (“**ZEN**” or the “**Company**”) is pleased to announce that a recent peer reviewed research article clearly demonstrates that ZEN's Albany Graphite exfoliates more easily than other commercially available flake graphite test samples. Significantly, this article provides quantitative data that ZEN's Albany PureTM Graphite has the highest exfoliation rate constant of the materials tested, indicating that it exfoliates more easily than the other materials.

This study was recently published in the peer reviewed journal, [Carbon](#) and utilizes an interfacial trapping exfoliation process which is spontaneous and driven by the spreading of graphene at a liquid-liquid interface between two immiscible fluids (e.g. oil and water) and thus lowering the free energy of the system. The article reported “the time to reach full emulsion for the Albany PureTM material was much shorter than for other graphite reference material (Figure 1). The paper also concluded that “the source of the graphite plays a role in the exfoliation in addition to the flake size”. This advantage will likely translate into a more efficient and economic exfoliation process as the company advances towards commercialization. Additional testing was also conducted to compare the purified

East Pipe and West Pipe material and confirmed very similar exfoliation rates for the two pipes as shown in Figure 2 below.

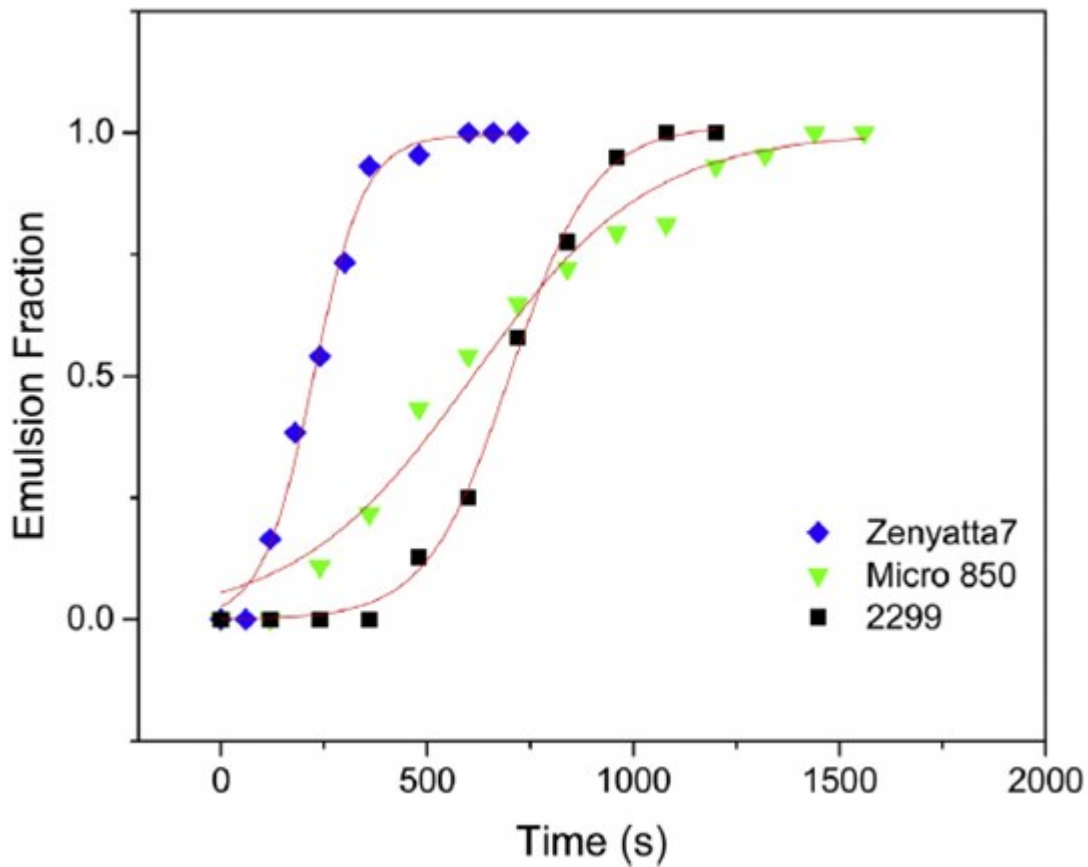


Figure 1: Plot showing ZEN vs. other Graphite
(Zenyatta7 = Zen_W1016F)

To view an enhanced version of Figure 1, please visit:

https://orders.newsfilecorp.com/files/1429/61207_e7c004a7c44f5858_002full.jpg

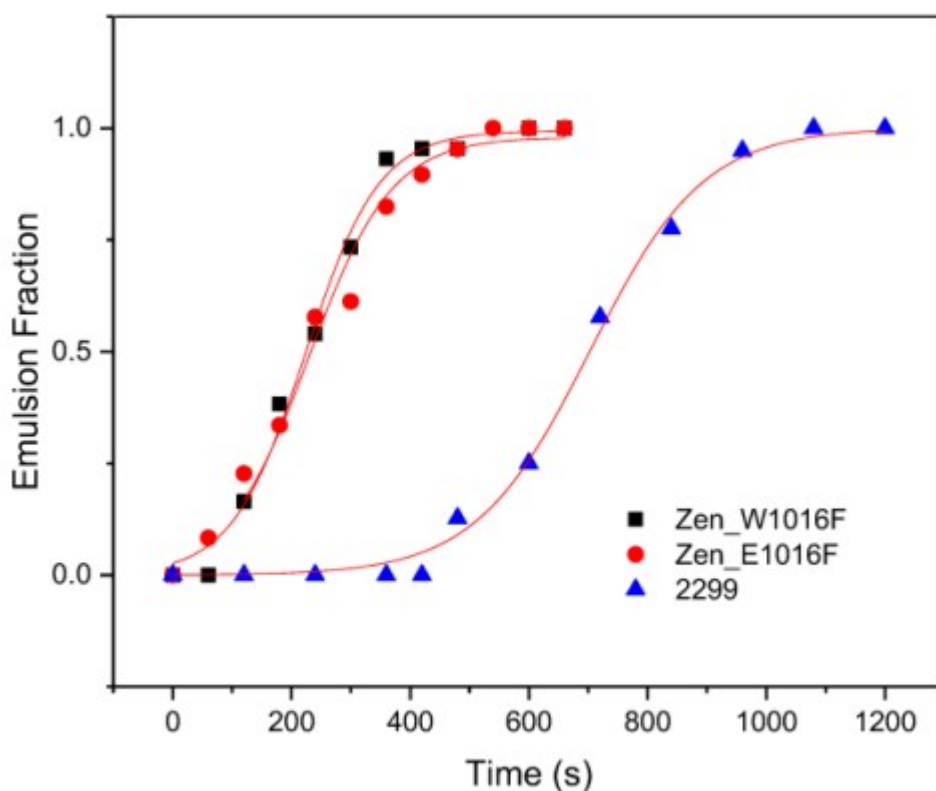


Figure 2: Plot showing East vs. West Pipe

To view an enhanced version of Figure 2, please visit:

https://investornews.wpengine.com/wp-content/uploads/2022/11/61207_e7c004a7c44f5858_003full-1.jpg

Francis Dubé, ZEN CEO commented, “We have known for a long time that our material exfoliated into graphene faster and better than flake graphite but quantifying it so clearly was a significant confirmation. I want to thank Prof. Douglas Adamson at UConn for his excellent research!”

These results provide additional third-party confirmation that Albany Pure™ Graphite exfoliates more easily than other commercially available graphite material and supports the results that were published by Dr. Yoshihiko Arao, Assistant Professor in the Department of Chemical Engineering at Tokyo Tech and reported in an October 16, 2018 [news release](#). In this article, it was reported that the particle size was linked to

the ease of producing graphene from graphite through exfoliation – the smaller the feed graphite particle, the easier to exfoliate. The researchers further concluded that, due to the size of its flakes, the exfoliation productivity of graphite derived from ZEN's Albany Pure™ Graphite performed up to 1500% better than the researchers' reference flake graphite materials. Interestingly, in the UConn study, the ZEN samples had a slightly larger flake size than the other graphite samples, yet still showed faster exfoliation. The company surmises that the turbostratic nature along with the slightly larger d-spacing between the layers were the reason why Albany Pure™ Graphite performed better in this study.

ZEN Graphene Solutions is also seeking advanced applied graphene-related research projects where ZEN could support this research by providing customized graphene materials and, in some cases, funding in exchange for some commercialization rights to be negotiated. Please submit your proposals in confidence to researchproposals@ZENGraphene.com.

Mr. Peter Wood, P.Eng, P.Geo., President of ZEN Graphene Solutions Ltd., is the "Qualified Person" for the purposes of National Instrument 43-101 and has reviewed, prepared and supervised the preparation of the technical information contained in this news release.

About ZEN Graphene Solutions Ltd.

ZEN is an emerging graphene technology solutions company with a focus on the development of graphene-based nanomaterial products and applications. The unique Albany Graphite Project provides the company with a potential competitive advantage in the graphene market as independent labs in Japan, UK, Israel, USA and Canada have independently demonstrated that ZEN's Albany

Pure™ Graphite is an ideal precursor material which easily converts (exfoliates) to graphene, using a variety of mechanical, chemical and electrochemical methods.

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To find out more about ZEN Graphene Solutions Ltd., please visit our website at www.ZENGraphene.com. A copy of this news release and all material documents in respect of the Company may be obtained on ZEN's SEDAR profile at www.sedar.ca.

Forward-Looking Statements

This news release contains forward-looking statements. Since forward-looking statements address future events and conditions, by their very nature they involve inherent risks and uncertainties. Although ZEN believes that the assumptions and factors used in preparing the forward-looking information in this news release are reasonable, undue reliance should not be placed on such information, which only applies as of the date of this news release, and no assurance can be given that such events will occur in the disclosed time frames or at all. ZEN disclaims any intention or obligation to update or revise any forward-looking information, whether as a result of new information, future events or otherwise, other than as required by law. Neither the TSX Venture Exchange nor its Regulation Services Provider (as that term is defined in the policies of the TSX Venture Exchange) accepts responsibility for the adequacy or accuracy of this release.