Professor Dusan Losic
Director ARC Graphene Research Hub
Leader Nano Research Group
School of Chemical Engineering and Advanced Materials
THE UNIVERSITY OF ADELAIDE
North Engineering Building
Adelaide 5005, SA, AUSTRALIA
Phone: + 61 8 8313 4648
Email: dusan.losic@adelaide.edu.au
http://chemeng.adelaide.edu.au/losic-group/
https://ecms.adelaide.edu.au/graphene-research-hub/

2D Materials | Graphene | Characterization | Life Impact

Ms. Doris Yang,
[C] Journal of Carbon Research (MDPI)

24th April 2021

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Dear Ms. Doris Yang,

We would like to thank you for your email on 23th April 2021, together with the comments from the reviewer on our revised manuscript (**carbon-1177630**) entitled '*Thermal Gravimetric Analysis (TGA) of Graphene Materials: Effect of Particle Size of Graphene, Graphene oxide and Graphite on Thermal Parameters*' as a full-length article submitted to *Journal of Carbon Research*.

Please find below our responses to this Reviewer comments.

Finally, thank you again to the Editorial team for handling our manuscript so expeditiously and for its publication in *Journal of Carbon Research*.

Sincerely yours

Prof. Dusan Losic

Authors' Response to Reviewer(s)' Comments (Manuscript ID: carbon-1177630)

Reviewer#1 comments

After seeing the modifications made, I think some items were improved from the previous review, but there are still a lot of uncertainties regarding the particle size. Since this is a major factor they are basing their particle ranges on, I think it requires further examination. I still find Table 1 to be more confusing than useful and I think the authors should reconsider their presentation of the data they have collected. In addition, all Supplementary Information data should have error bars, especially in the case of particle measurements.

Authors' response:

To measure particle size of graphene materials in this paper we used combination of two most common and recommended methods. One is using SEM/TEM imaging of dispersed graphene particles on Si wafer as defined by International standard ISO/TS 21356-1:2021 where the size of 2 dimensional graphene particles (LxW length X Width) were manually measured from images and presented by one dimension plus st. dev. This is defined and recommended method by International ISO standard to presenting lateral size of graphene particles from images which is maybe confusing for the reviewer.

The second method was using PSD/LD by measuring average particle size of graphene dispersed in solution where average particle size distribution (D50) was obtained by software based on measuring the angular variation of the light small angles relative to the laser beam and small particles scatter light at large angles considering the graphene particles are spherical.

Merits and limitations of both methods are explained in paper and known in literature which are reasonable in good agreement. In this paper we used PSD/LD data to generate graphs to show the influence of particle size on TGA parameters and we are confident that all presented results are correct.

Changes in revision 2:

1. *The graphs for PDS/LD measurements in 3 replicates for samples are presented in Figure S3 showing negligible differences in their graphs which average values were presented in Table 1 with st. dev as zero point (only two decimals were considered). The std. dev. values have already been included in our previous revision documents but additional decimal places have been included to address the response from reviewer and included in Table 1 (row 3)*
2. *Calculation of the surface area of particles measured by SEM/TEM method is removed from the Table 1 to avoid confusion.*

	GO			Graphene					Graphite			
	GO1	GO2	GO3*	Gr1	Gr2	Gr3	Gr4	Gr5*	Gft1	Gft2	Gft3	Gft4*
Sieve fraction/µm	≤ 25	25-53	un-sieved	N.A.					≤ 25	25-53	53-100	100-150
Average lateral size, SEM ± stdev (µm)	23.5 ± 10.6	46.4 ± 21.2	73.4 ± 40.4	7.0 ± 2.8	15.9 ± 3.7	28.3 ± 0.5	49.4 ± 6.0	52.8 ± 3.4	11.3 ± 2.1	44.9 ± 37.0	130.6 ± 13.7	158.8 ± 20.2
Average $d(50)_v$ from LD ± stdev (µm)	28.6 ± 0.010	45.7 ± 0.077	120.2 ± 0.032	7.6 ± 0.028	13.2 ± 0.018	36.8 ± 0.043	60.3 ± 0.060	73.4 ± 0.100	24.2± 0.099	60.0 ± 0.028	104.0 ± 0.056	148.8 ± 0.006