GIGATON RESEARCH®
Revolutionizing Graphene for Future Technology

Technical Data Sheet

Type: Few Layer Graphene

Product Description:

Gigaton Graphene is a high-quality few-layer graphene featuring large lateral flake size, high aspect ratio, low oxygen content, and minimal structural defects. Produced through an innovative proprietary process, Gigaton Graphene delivers exceptional performance consistency. Its unique material characteristics make it an ideal solution for enhancing the mechanical, electrical, thermal, and functional properties of a wide range of advanced materials and products.

Physical and Chemical Properties:

Parameters	Value
Appearance	Fluffy Light Powder
Particle Shape	Graphitic (sp^2)
Colour	Dark Gray
Odour	Odourless
CAS No.	1034343-98-0
No. of Layers (1)	1-5
Bulk Density	0.0254-0.0295 g/cm^3
Moisture Content (2)	< 0.1 wt%
BET Surface Area (3)	440-560 m^2/g
Apparent Thickness	< 2 nm
Flake Size : Average Lateral Size (4)	30-50 µm
Dv(10)	~10 µm
Dv(50)	~30 µm
Dv(90)	~55 µm
Chemical Composition (at %) : Carbon (5)	> 99 at%
Oxygen (5)	~ 0.010 at%
Hydrogen (5)	~ 0.034 at%
Sulphur (5)	Not Detected
Nitrogen (5)	Not Detected
Chlorine (5)	Not Detected
Metals (5)	Not Detected
Defect Ratio $I_{(D)}/I_{(G)}$ (6)	0.09 – 0.15
Dispersibility	Organic solvents: IPA, DMF, NMP, DMSO

(1) As determined by Laser Raman Spectroscopy. UP to 90% of flakes within this range

(2) As determine by Thermogravimetric Analysis (TGA)

(3) As determine by Brunauer-Emmett-Teller (BET) analysis

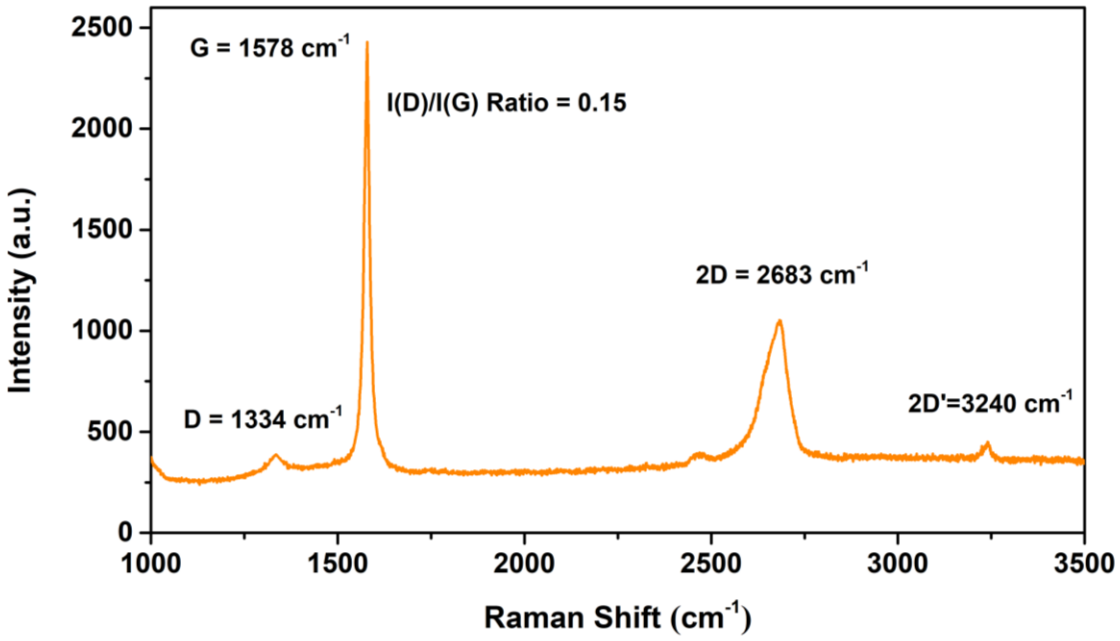
(4) As determine by Laser Scattering Technique (Malvern Mastersizer 3000 – Mie Scattering Method)

5) As determine by X-Ray Photoelectron Spectroscopy (XPS), EDS Analysis, and CHNSO Measurements

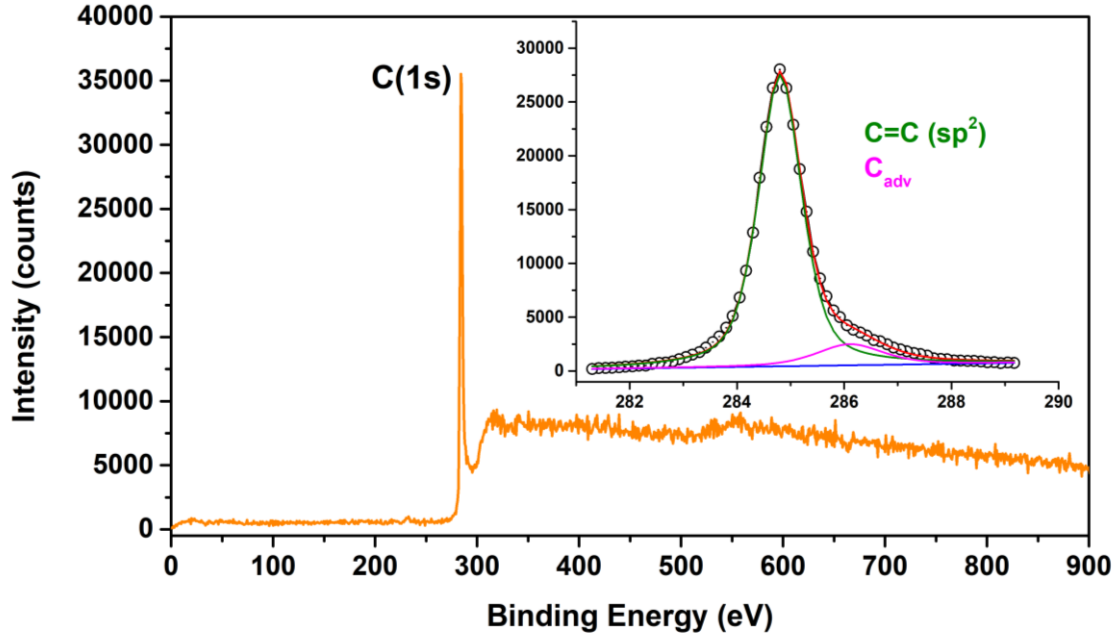
(6) As determined by Laser Raman Spectroscopy

Typical Characterization Data:

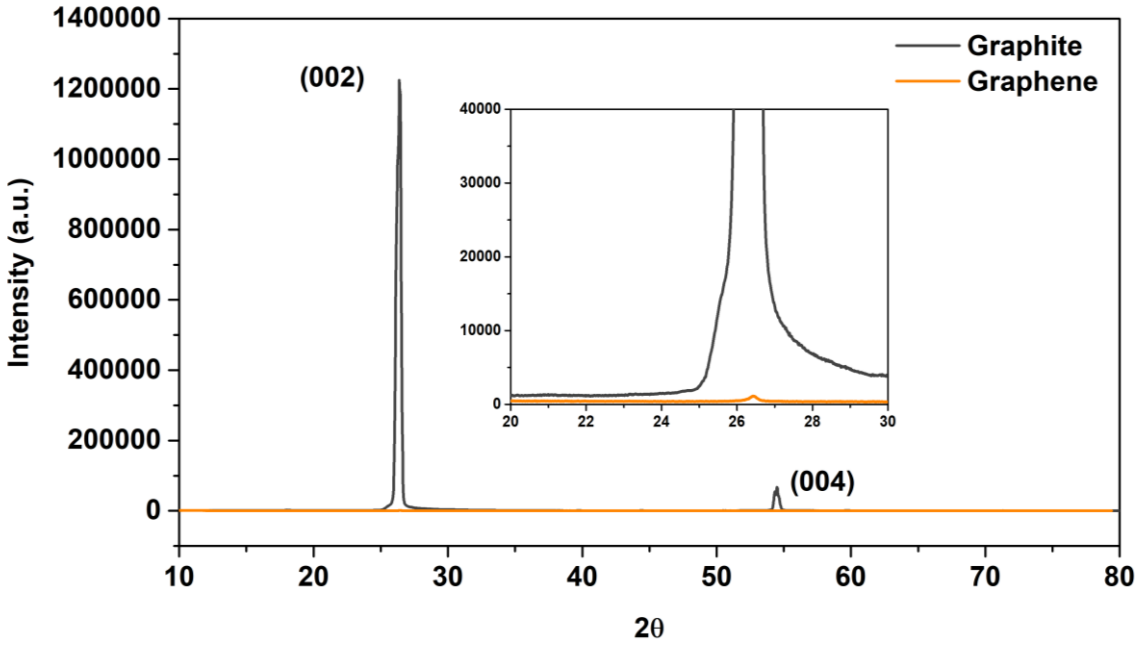
Raman Spectroscopy:



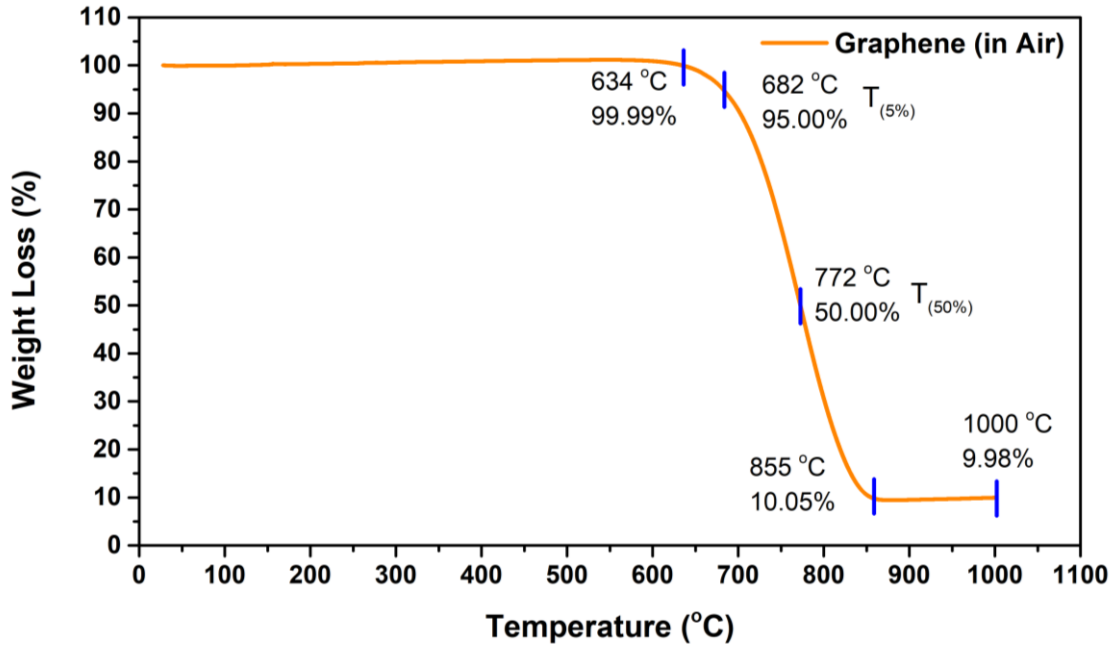
XPS Spectroscopy:



XRD Spectra:

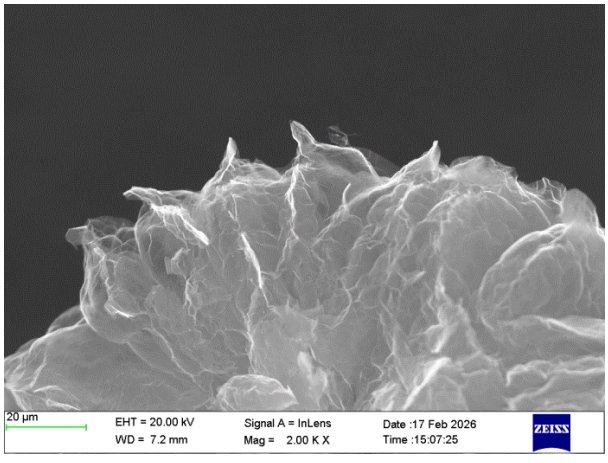


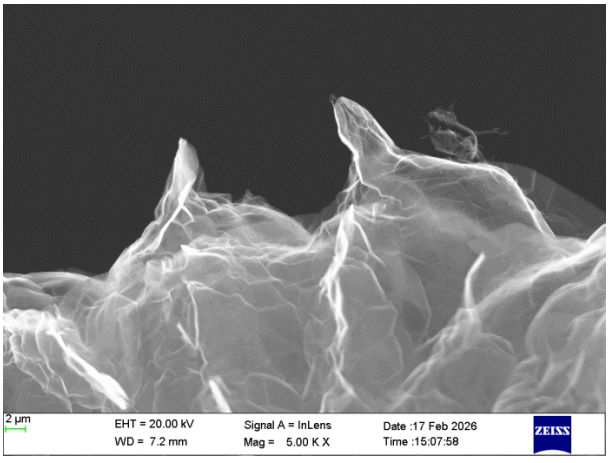
Thermogravimetric Analysis (TGA):



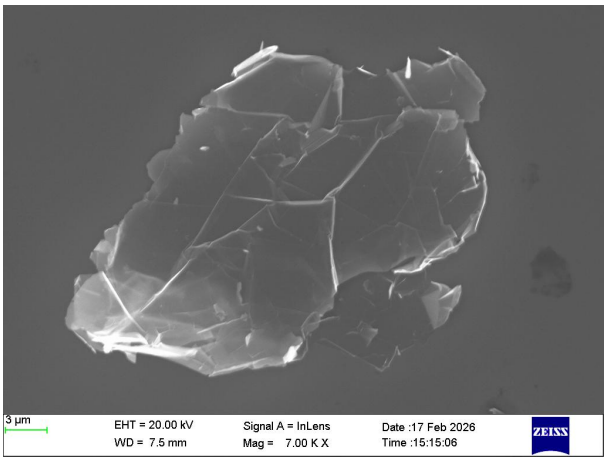
High Resolution Scanning Electron Microscopy :

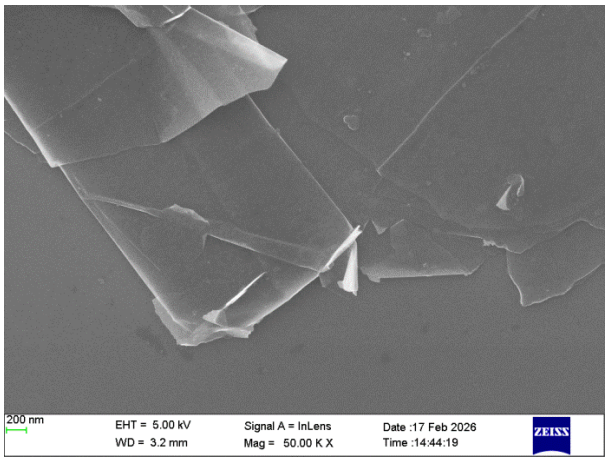
Before Dispersion



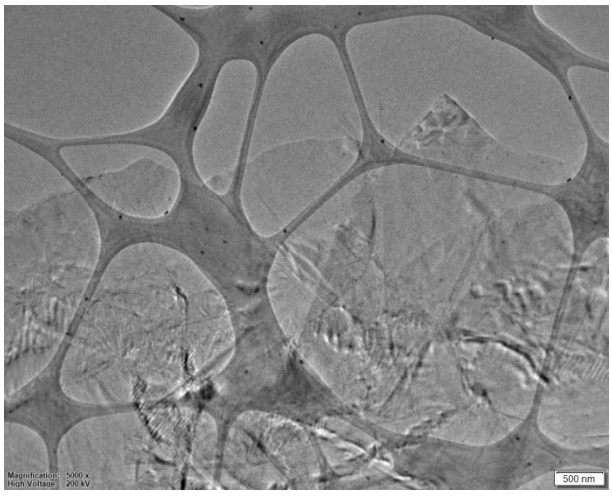


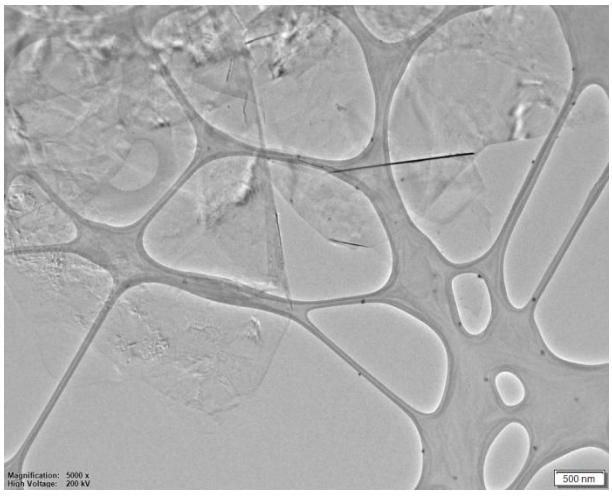
After Dispersion in Solvent

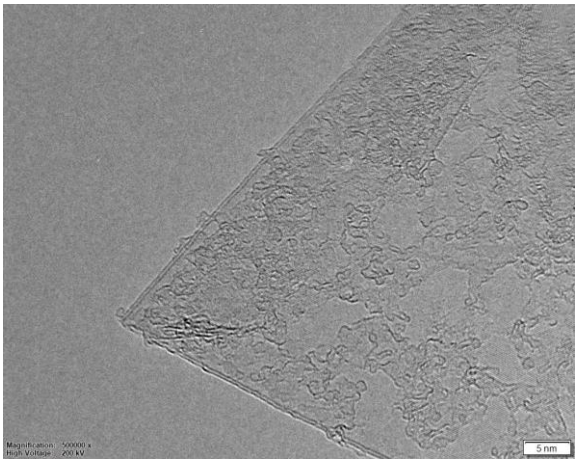


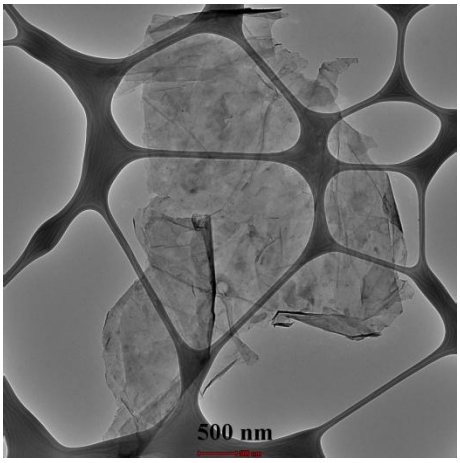


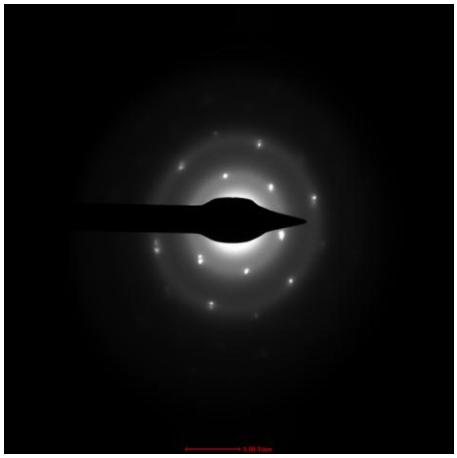
High Resolution Transmission Electron Microscopy :











Key Features and Advantages:

- Verified few-layer graphene
- Large lateral size of flakes (high thermal conductivity and excellent mechanical strength)
- Very low oxygen content – high C:O ratio
- Defect-free graphene
- Product free from metallic contaminants

- Full quality control and batch to batch consistency

Application Areas:

- Textiles
- Composites Material
- Concretes Material
- Coolants
- Elastomers
- Energy Storage
- Paints & Coatings
- Lubricants
- Sensors
- Defence and Aerospace
- Thermoplastic and Thermoset Materials

Instructions:

This product can be dispersed in water with surfactants, organic solvent, or the desired solvent mixture via one hour of ultra-sonication.

This product can be directly added into a paint formulation using a horizontal mill, inline high-shear mixtures, high-speed mixer or high-shear mixer.

This product can be directly added into a liquid polymer or rubber matrix using a three roll mill, inline high-shear mixtures, high-speed mixer or high-shear mixer.

For polymer and rubber granules/powder, this product should initially be mixed using a rotary drum mixers or high-shear mechanical mixer prior to feeding into the extruder hopper.

We will provide further instructions upon request. If you require more info, contact us.

Gigaton Research takes no responsibility for the result of any mixing with or exposure to other substances!

Product Disclaimer:

General Disclaimer

The graphene materials supplied by Gigaton Research Private Limited are intended for research, industrial development, and commercial manufacturing purposes only. All technical data, specifications, and recommendations provided are based on internal testing and are believed to be accurate at the time of printing. However, no warranty, express or implied, is made regarding the completeness, accuracy, or suitability of this information for specific applications.

Performance Disclaimer

The performance of graphene materials may vary depending on formulation methods, processing parameters, dispersion techniques, substrate compatibility, environmental conditions, and end-use applications. Customers are solely responsible for conducting independent testing, validation, and qualification of the material in their specific systems prior to commercial deployment.

Gigaton Research Private Limited does not guarantee performance outcomes in any particular application unless explicitly agreed upon in writing.

Application & Regulatory Compliance Disclaimer

Our graphene products are not certified for:

- Medical or pharmaceutical use
- Human implantation or in vivo applications
- Food, cosmetic, or nutraceutical applications
- Defense or restricted applications

Unless expressly stated and supported by appropriate regulatory approvals.

Customers are responsible for ensuring compliance with all applicable local, national, and international laws and regulations regarding the handling, processing, transport, storage, and disposal of graphene materials.

Handling & Safety Disclaimer

Graphene materials should be handled in accordance with appropriate laboratory, industrial safety protocols, and the latest Safety Data Sheet (SDS) provided. Fine powders and dispersions may present inhalation, dust explosion, or environmental risks if improperly handled.

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