NOVO GRAPHENE

Reduced Graphene Oxide

Technical Data Sheet

Issue date: Feb 20, 2025

General Description

Product Name	:	Reduced Graphene Oxide Powder
Product Number	:	Gr-0003
CAS Number	:	1034343-98-0
Category	:	Carbon Nanomaterials
Preparation method	:	Chemical exfoliation/Thermal treatment
Physical form	:	Fluffy, very light powder
Chemical formula	:	C
Average number of layers	:	~8 layers
Elemental composition	:	Carbon and oxygen
Colour	:	Greyish Black

Raman Spectroscopic Analysis

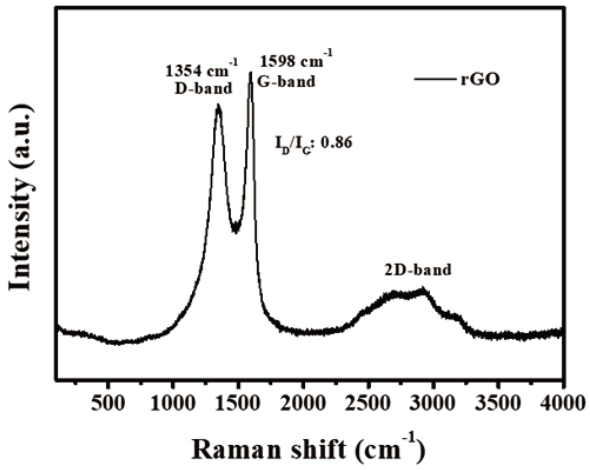

Figure 1 Raman scattering spectrum for the reduced graphene oxide. The presence of D-band, G-band and broad 2D-band clearly presents the graphitic structure in the rGO. The ID/IG value of 0.86 is due to the presence of defects (from the presence of oxygen functionalities and disruption of sp2 network during the chemical oxidation and annealing) in the graphitic structure.

Powder X-Ray Diffraction (PXRD)

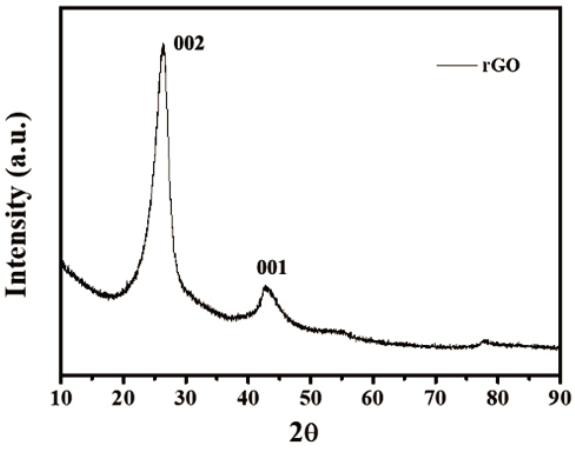

Figure 2 Powder X-ray diffraction pattern for reduced graphene oxide. The sharp peak at 2θ of 26° and small peak at 43° clearly defining the formation and purity of reduced graphene oxide.

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Field Emission Scanning Electron Microscope (FESEM)

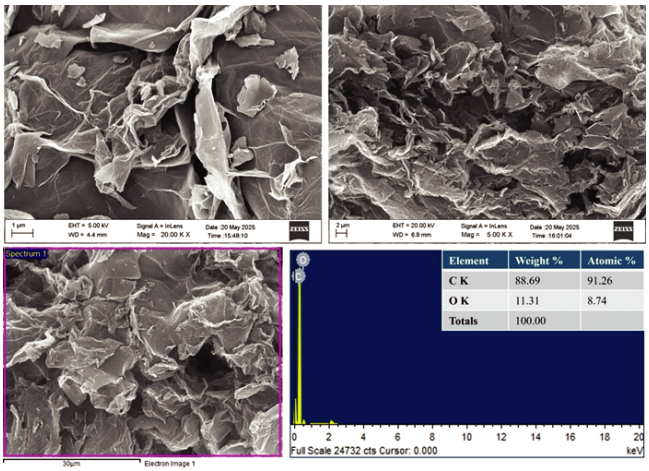

Figure 3 Field emission scanning electron microscopic images and electron diffraction data. It clearly presents the three dimensional layered like structure of reduced graphene oxide. The EDS spectrum shows the presence of 88.69 wt.% of carbon and 11.31 wt.% of oxygen in the sample. This elemental information coincides with that observed from the CHNS analysis data as presented in the following Table.

Elements	Percentage (%)
Carbon (C)	86
Oxygen (O)	14

Summary

Parameters	Result	Remark
Synthesis Process	Chemical exfoliation integrated with thermal annealing	This is a scalable and cost-effective process to produce high pure reduced graphene oxide.
Raman analysis	Very distinguish D- and G-bands like graphene particles	It clearly indicates the restoration of the graphitic structure after the chemical exfoliation.
Particle shape	Layered	The particles are of highly layered like structure.
Particle size	D90: <5µm	This size of particle fits well in many of the coating and emulsion application.
Elemental composition	Carbon: 86% Oxygen: 14%	The presence of oxygen defines the surface functionalization of the layered graphene structure. These functional groups will act as anchoring points of the particles during the dispersion in polymeric media.

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