Safety Data Sheet

According to GHS rev. 7 / 29 CFR 1910.1200

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name:	Graphene oxide powder
Trade Names:	Graphenoil Graphene Oxide Powder.
EC #	947-768-1

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses:
Research use.

1.3. Details of the supplier of the safety data sheet

Graphenoil
16310 Hollister St.
Houston, TX 77066
Email for SDS: info@graphenoil.com
Phone: (+1) 832-666-3143

1.4. Emergency telephone number

(+1) 832-666-3143

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Not classified as a hazardous substance according to GHS (rev. 7).

Please notice that substance properties used for the hazard assessment come from graphite (bulk substance). The properties of the nanoform are under evaluation and to some extent not known.

2.2. Label elements

No label required

2.3. Other hazards

Physical Hazards: Care should be taken to avoid accumulations of graphene oxide dusts or powders in places where these accumulations could cause shorting of electrical switches, circuits or components.

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance name	Graphene oxide
Description	Graphene oxide is a thin layer of oxidized carbon; it is a single, tightly packed layer of carbon atoms that are bonded together in a hexagonal honeycomb lattice.
EC	947-768-1

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	In case of discomfort provide fresh air, warmth and rest, preferably in a comfortable upright sitting position. Rinse nose and mouth with water. Get medical attention if any discomfort continues. If breathing stops, provide artificial respiration.
Ingestion	NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Rinse nose, mouth and throat with water, and then drink plenty of water. Get medical attention.
Skin contact	Wash skin with soap and water. Continue to rinse for at least 15 minutes. Get medical attention if irritation appears after washing.
Eye contact	Do not rub eye. Immediately flush with plenty of water for up to 15-20 minutes. Remove any contact lenses after 5 minutes, maintain open eyes wide apart. Get medical attention promptly if symptoms occur after washing.

4.2. Most important symptoms and effects, both acute and delayed

Inhalation	It may cause irritation to respiratory tract/inhalation
Ingestion	No effects recorded
Skin contact	It may cause skin irritation.
Eye contact	It may cause eye irritation.
Delayed effects	No delayed effects known.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically. Contact a medical centre immediately in case of ingestion or inhalation of a large amount of product. Specific treatment: No specific treatment.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: The substance is not combustible, use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Special hazards arising from the substance or mixture

In the event of combustion or thermal decomposition, this material may release carbon monoxide (CO) or carbon dioxide (CO_2) or other toxic gases. **IN CASE OF THERMAL TREATMENT PLEASE DO IT CAREFULLY AT SLOW HEATING RAMPS. ENERGY REALISE AT TEMPERATURES AROUND 180ºC**. At temperatures over 180ºC, this material may react with potassium, sodium, rubidium, or cesium to create intercalation compounds that may ignite and may react explosively with water.

5.3. Advice for firefighters

In general, graphene oxide is difficult to combust. Normal care should be taken to avoid dust explosion risk caused by high concentrations of dust or finely suspended airborne particles (although graphite dust is not normally considered to have an explosive hazard). Use respiratory protective equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Emergency responders should wear suitable protective equipment to prevent inhalation or skin contact. In case of spills, beware of slippery floors and surfaces.

6.2. Environmental precautions

Do not allow to enter drains, sewers or watercourses. The product should not be dumped in nature but collected and delivered according to local regulations.

6.3. Methods and material for containment and cleaning up

Spilled or released material should be collected mechanically and disposed of in suitable containers. Prevent dust generation.

6.4. Reference to other sections

For personal protection, see section 8.
For waste disposal, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid contact with skin and eyes. Wear personal protective equipment to prevent skin and eye contact. Do not wear contact lenses when using this product. Prevent dust generation. Avoid dust inhalation using local ventilation or appropriate filters.

7.2. Conditions for safe storage, including any incompatibilities

This material should be stored in labelled closed containers away from sources of ignition or heat. Care should be taken to avoid creating accumulations or concentrations of dust.

7.3. Specific end use(s)

Research use.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Substance: Graphite (CAS 7782-42-5)

	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m³	ppm	mg/m³
Australia		3 (1)(2)(3)(4)		
Belgium		2		
Canada - Ontario		2 (1)		
Canada - Québec		2		
Denmark		2,5 respirable aerosol		5 respirable aerosol
Finland		2		
France		2 respirable aerosol		
Germany (DFG)		4 inhalable aerosol		
		1,5 respirable aerosol		
Ireland		10 (1)		
		4 (2)		
Latvia		2 (1		
New Zealand		3 (1)(2)		
People's Republic of China		4 (1)		
		2 (2)		
Singapore		2 respirable aerosol		
South Korea		2 (1)(2)		
Spain		2 inhalable aerosol		
Sweden		5 inhalable aerosol		
Switzerland		5 inhalable aerosol		
		2,5 respirable aerosol		
USA - NIOSH		2,5 (1)		
USA - OSHA		15 total dust		
		5 respirable dust		
United Kingdom		10 inhalable aerosol		
		4 respirable aerosol		

Remarks	
Australia	(1) all forms except fibres (2) respirable aerosol (3) natural and synthetic (4) containing no asbestos and<="" td="">
Canada - Ontario	(1) Respirable aerosol
Ireland	(1) Inhalable fraction (2) Respirable fraction
Latvia	(1) natural and industrial diamond, graphite
New Zealand	(1) Respirable dust containing <1 % free silica (2) all form except graphite fibres
People's Republic of China	(1) Inhalable fraction (2) Respirable fraction
South Korea	(1) Natural & synthetic except graphite fibers (2) Respirable fraction
USA - NIOSH	(1) natural graphite

8.2. Exposure controls

Protective equipment

Engineering measures

Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of dust. Local exhaust ventilation should be employed if dust is generated when handling. Provide eyewash station.

Personal Protective Equipment

Respiratory equipment	Respiratory protection must be used if the general level exceeds the recommended occupational exposure limit. A respiratory protection program that meets applicable OHSA (USA) or CEN (UE) requirements should be maintained in the workplace. When manipulating the powder out of a fume hood P3 dust mask should be used.
Hand protection	Wear protective gloves.
Eye protection	Wear approved safety goggles. Use face shield in case of splash risk.
Body protection	Wear full body industrial type work clothing.

Environmental exposure controls

All ventilation systems should be filtered before discharge to atmosphere. Avoid releasing to the environment. Avoid uncontrolled releases. Inform competent authorities in case large spillage into water courses.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Powder
Colour	Brown
Odour	Odourless
Initial boiling point and boiling range (ºC)	Not applicable.

Melting point (ºC)	Not applicable
Vapour density (air=1)	Not applicable.
Vapour pressure	Not applicable.
Evaporation rate	Not applicable.
pH-Value, Conc. Solution	Not applicable.
Viscosity 40ºC	Not applicable.
Bulk density	1.0 – 2.0 g/cm3
Solubility Value	Negligible.
Decomposition temperature (°C)	-
Flash point (°C)	Not applicable.
Auto Ignition Temperature (°C)	Not applicable
Oxidising properties	Not applicable (the substance is incapable of reacting exothermically with combustible materials on the basis of chemical structure)).

9.2. Other information

No information required.

SECTION 10: Stability and reactivity

10.1. Reactivity

There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal temperature conditions.

10.3. Possibility of hazardous reactions

At temperatures over 180ºC, this material may release energy and may react with potassium, sodium, rubidium, or cesium to create intercalation compounds that may ignite and may react explosively with water.

10.4. Conditions to avoid

Not known

10.5. Incompatible materials

Avoid contact with strong oxidizing agents, fluorine, or chlorine trifluoride.

10.6. Hazardous decomposition products

Under fire conditions, this material may release carbon monoxide (CO) or carbon dioxide (CO2) or other toxic gases.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Absorption, distribution, metabolism	
Absorption	No data available
Distribution	No data available
Potential for accumulation	No data available
Toxicologically significant metabolite	No data available
Acute toxicity	
Rat LD50 oral	No data available
Rat LD50 dermal	No data available
Rat LC50 inhalation	No data available
Skin irritation	No data available
Eye irritation	No data available
Skin sensitization	No data available
Genotoxicity	
OECD 476: In vitro mammalian cell gene mutation test **Negative** OECD 487: In vitro mammalian cell micronucleus test **Negative**	
Long term toxicity and Carcinogenicity	
No data available	
Reproductive toxicity	
No data available	

SECTION 12: Ecological information

12.1. Toxicity

No data available

12.2. Persistence and degradability

No data available

12.3. Bioaccumulative potential

No data available

12.4. Mobility in soil

No data available

12.5. Other adverse effects

No information required.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information

When handling waste, consideration should be made to the safety precautions applying to handling of the product. Waste should not be disposed of by release to sewers. Uncleaned packagings: Disposal must be made according to official regulations.

SECTION 14: Transport information

14.1. UN number

Not classified as a dangerous good for transport under DOT, IMDG, ADR, RID, or ICAO/IATA

14.2. UN proper shipping name

No information required.

14.3. Transport hazard class(es)

No information required.

14.4. Packing group

No information required.

14.5. Environmental hazards

No information required.

14.6. Special precautions for user

No information required.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

No information required.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA 302 Components: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards: No SARA Hazards

Massachusetts Right To Know Components: No components are subject to the Massachusetts Right to Know Act.

New Jersey Right To Know Components: CAS-No. Water 7732-18-5

Pennsylvania Right To Know Components: CAS-No. Water 7732-18-5

California Prop. 65 Components: This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

TSCA: not listed. R&D only.

SECTION 16: Other information

Advice on any training appropriate for workers	To ensure protection of human health and environment, workers must be provided with proper training about how to handle and store chemicals used at work.
Revision Date	05 March 2020
Substituted version	7.0

This information is based on our present state of knowledge and our research into available scientific literature as well as information obtained from our vendors. Graphenea S.A. makes no responsibility regarding the accuracy of the scientific literature or any third-party information and, therefore, cannot guarantee any specific material properties. Use of this information shall not establish a legally binding relationship.

The information provided in this SDS must be considered as a starting point for a comprehensive program of health and safety in your company. If further data on the product is required to perform your risk assessment, contact us and we will try to assist as much as possible.