

MATERIAL SAFETY DATA SHEET

Trade name: Graphenea- Graphene Films

Revised April 2014

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Graphenea-Monolayer graphene made via CVD

Common Names: CVD graphene film on SiO₂/Si substrate

Manufacturer: Graphenea S.A.

Tolosa Hiribidea 76

20018 Donostia-San Sebastian - Spain

2. HAZARD IDENTIFICATION

Potential Health Effects: Generally not hazardous in normal handling, however good laboratory practices should always be used.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Material: Graphene film on SiO₂/Si substrate.

4. FIRST AID MEASURES

General: No special measures required.

Inhalation: Seek medical treatment in case of complaints.

Eye contact: Rinse opened eye for several minutes under running water. If symptoms persist, consult doctor.

Skin contact: The product is not skin irritating.

Ingestion: Rinse mouth with water.

Clothing: Contaminated clothing should be removed and washed thoroughly before re-use.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media: Use fire fighting measures that suit the environment.

Other Combustion Hazards: No special measures required.

Protective Equipment: As with any fire, wear self-contained breathing apparatus and protective clothing to prevent contact with skin, eyes or lungs.

6. ACCIDENTAL RELEASE MEASURES

Spilled or released material should be collected mechanically and disposed of in suitable containers. Use care during cleanup to prevent the creation of concentrations of dust.

Personnel: Not required.

Environmental: Do not allow material to be released to the environment without proper governmental permits.

7. HANDLING AND STORAGE

Storage: Keep containers tightly sealed. Store in cool, dry place in tightly closed containers. No special precautions necessary if used correctly.

Advice on Safe Handling: No special requirements.

8. EXPOSURE CONTROL/PERSONAL PROTECTION Exposure Guidelines

Additional information about design of technical systems: No further data.

General protective and hygienic measures: The usual precautionary measures should be adhered to in handling the chemicals.

Breathing equipment: Not required.

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Protection of hands: Not required.
Eye protection: Safety glasses.
Body protection: Protective work clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form: One atom thick film on Si/SiO₂ (300nm).
Color: Colorless.
Odor: Odorless.
Melting point: Si/SiO₂ (300nm) 1600-1725 °C ; Graphene approx. 3600°C.
Boiling point: Si/SiO₂ (300nm) 2230 °C; Graphene not applicable.
Flash point: Not applicable.
Vapor density: Not applicable.
Bulk density (20°C): Si/SiO₂ (300nm) 2,648 g/cm³; Graphene 2.09–2.23 g/cm³.
Flammability: Product is not flammable.
Solubility in water: Insoluble.
Evaporation Rate: Not applicable.
Ignition temperature: Not determined.

10. STABILITY AND REACTIVITY

This material is stable. Avoid contact with strong oxidizing agents, fluorine, or chlorine trifluoride. There are no known hazardous decomposition products.

11. TOXICOLOGICAL INFORMATION Acute oral toxicity

Irritant effect on skin: Not tested
Irritant effect on eyes: Not tested
Carcinogenicity: Not tested

12. ECOLOGICAL INFORMATION

Graphene is not biodegradable. To the best of our knowledge, there is no reliable data regarding its bioaccumulation or mobility in environmental media, nor is there reliable data to suggest that it should be considered an environmental hazard.

Si/SiO₂ (300nm): Generally not hazardous for water. Do not allow material be released to the environment without proper governmental permits.

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with all local, state, or federal regulations.

14. TRANSPORT INFORMATION

This material is not defined under US DOT, IMDG, GGVSee, or ICAO/IATA regulations as a hazardous substance.

15. REGULATORY INFORMATION

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

Labelling according to Regulation (EC) No 1272/2008: Not applicable

Information about limitation of use: For use only by technically qualified individuals.

16. OTHER INFORMATION

This information is based on our present state of knowledge and our research into available scientific

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literature as well as information obtained from our vendors. Graphenea S.A. makes no responsibility on 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.