(1) PRODUCT AND COMPANY IDENTIFICATION

Identification of the substance or preparation

TRADE/MATERIAL NAME: Graphene Nanoplatelets
CHEMICAL NAME: Graphene
SYNONYMS: Few-layered graphene

This SDS is valid for the following Graphene Grades:
PureWave Graphene, PureSheets MONO, PureSheets QUATTRO

Use of the substance/Preparation: For laboratory research purposes only.

Supplier: Raymor Industries Inc.
3765 La Vérendrye
Boisbriand, Quebec, J7H 1R8
CANADA
Phone No.: +1 450.434.6266

Emergency Telephone:
US: CHEMTREC 1-800-424-9300 or 1-703-527-3887
Canada: CANUTEC 1-613-996-6666 (24 hour transportation emergency)

(2) HAZARDS IDENTIFICATION (EC)

GHS Classification
Not available

GHS Label elements, including precautionary statements

Signal Word: Warning
Hazard Statements: May form combustible dust concentrations in air.

WHMIS Classification
Not available
OSHA/HCS Status:
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture: COMBUSTIBLE DUSTS

Precautionary statement(s):
Keep container tightly closed. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Sanding and grinding dusts may be harmful if inhaled. Prevent dust accumulation. Emits toxic fumes when heated.

HMIS Classification
Health hazard: 2
Flammability: 0
Physical hazards: 0

Potential Health Effects:
- Inhalation: May be harmful if inhaled. Causes respiratory tract irritation.
- Skin: May be harmful if absorbed through skin. Causes skin irritation.
- Eyes: Causes eye irritation.
- Ingestion: May be harmful if swallowed.

Hazard codes: Xi

Risk Statements: R36/37/38

(3) COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>INGREDIENT NAME</th>
<th>CAS NUMBER</th>
<th>PERCENT</th>
<th>EC NUMBER</th>
<th>EC CLASSIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthetic Graphite</td>
<td>7782-42-5</td>
<td>90-100</td>
<td>231-955-3</td>
<td>Xi R36/37/38</td>
</tr>
<tr>
<td>Trace impurities</td>
<td>Not available</td>
<td>0-1</td>
<td>Not available</td>
<td>Not available</td>
</tr>
</tbody>
</table>
(4) FIRST AID MEASURES

Eye contact: Immediately flush eyes gently and thoroughly, including under the eyelids, with clean running water for 20 minutes.

Skin contact: Wash thoroughly with soap and water. Seek medical attention.

Inhalation: Remove victim to fresh air. Restore and/or support breathing as needed. Seek medical attention.

Ingestion: Call poison control centre. Never give anything by mouth to someone is unconscious or convulsing. Seek medical attention.

(5) FIRE-FIGHTING MEASURES

Suitable extinguishing media: Water fog, carbon dioxide, dry chemical, foam.

Decomposition products: Carbon monoxide, carbon dioxide and metal oxide.

Special protective equipment for fire-fighters: Wear self-contained breathing apparatus if the fire is large.

(6) ACCIDENTAL RELEASE MEASURES

Personal precautions: Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources. Prevent the formation of dust-air mixture.

Environmental precautions: Keep spilt material away from drains and runoff, ground-water and soil.

Methods for clean-up: Collect spilled material using a vacuum with HEPA filter. Avoid formation of dust.

(7) HANDLING AND STORAGE

Handling: Ensure good ventilation of the workplace. Avoid dust formation. Keep powder away from open flames and other sources of ignition. Keep work areas clean and free of waste. Avoid contact with skin and eyes.

Storage: Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Store away from strong oxidizing and reducing agents.
**(8) EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Exposure limit values:**

Occupational Safety and Health Administration Permissible Exposure Limit (OSHA PEL; United States):

Time Weighted Average (TWA): 5 mg/m³ Form: Respirable

TWA: 10 mg/m³

American Conference of Governmental Industrial Hygienists Threshold Limit Value (ACGIH TLV; United States, 4/2014):

TWA: 2 mg/m³ 8 hours. Form: Respirable fraction

OSHA PEL Z3 (United States, 2/2013) according to OSHA 29CFR 1910.1200 Subpart Z - Toxic and Hazardous Substances

TWA: 15 mppcf 8 hours.

**Occupational exposure controls:**

Install and operate general and/or local exhaust ventilation systems of sufficient power to maintain airborne concentration below the defined or recommended limit. If possible, manipulate under fume hood to avoid exposure.

**Respiratory protection:**

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard, such as NIOSH (US) or EN 143 (EU). Respirator selection must be based on known or anticipated exposure levels, the hazards of the material, and the safe working limits of the selected respirator. For little exposure, use type P95 (NIOSH) or type P1 (EN 143) respirators. For high exposure, use type P99 (NIOSH) or type P2 (EN 143) respirators. For further details, please consult the following ISO documents ISO/TS 12901-1:2012: Occupational risk management applied to engineered nanomaterials -- Part 1: Principles and approaches, as well as ISO/TS 12901-2:2014 : Occupational risk management applied to engineered nanomaterials -- Part 2: Use of the control banding approach.

**Hand protection:**

Handle with protecting gloves. Wash and dry hands after manipulation.

**Eye protection:**

Wear safety glasses conforming to an approved standard, such as NIOSH (US) or EN 166 (EU).

**Skin protection:**

Wear protective clothing to prevent contact with skin. The type of clothing must depend on the level of exposure to the product.
(9) PHYSICAL AND CHEMICAL PROPERTIES

General Information: Appearance – black powder
Odour – None

Important health, safety and environmental information:

pH: Not applicable.
Boiling point: Not available.
Flash point: Not available.
Explosive properties: Not available.
Oxidising properties: Not expected.
Vapour pressure: Not applicable.
Relative density: Not available.
Solubility: Not available.
Water solubility: Insoluble.
Partition coefficient: Not applicable.
Viscosity: Not applicable.
Vapour density: Not applicable.
Evaporation rate: Not applicable.

Other Information:
Melting point: 3652 – 3697 °C

(10) STABILITY AND REACTIVITY

This product is stable under normal storage conditions.

Conditions to avoid: Ignition source.
Materials to avoid: Oxidising and reducing agents.
Hazardous decomposition products: Under fire conditions: carbon monoxide and carbon dioxide.
(11) TOXICOLOGICAL INFORMATION

This product contains engineered nanoparticles which have structural features with at least one dimension of 100 nanometers or less.

Acute toxicity:

Irritant effect on skin: Skin contact with graphene powder may cause irritation.
Irritant effect on the eye: Eye contact has shown irritation.
Respiratory or skin sensitization: Graphene powder may cause skin sensitization.
Inhalation Inhalation can cause irritation.
Ingestion May be harmful if swallowed.

(12) ECOLOGICAL INFORMATION

No known significant effects or critical hazards.

(13) DISPOSAL CONSIDERATIONS

The generation of waste should be avoided or minimised whenever possible. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, and any by-product should at all times comply with the requirements of environmental protection and waste disposal legislation and any national, regional and local authority requirements.
SAFETY DATA SHEET
Product: Graphene Nanoplatelets

(14) TRANSPORT INFORMATION

UN Number: Not applicable
Shipping Name: Not applicable
Class: Not applicable
Packing Group: Not applicable
Label: Not applicable

(15) REGULATORY INFORMATION

EU REGULATIONS

Hazard Symbol:

R36/37/38 Irritating to eyes, respiratory system and skin.

Risk phrases:

Safety phrases:
S7 Keep container tightly closed.
S22 Do not breathe dust.
S29 Do not empty into drains.
S36/37/39 Wear suitable protective clothing such as a Tyvek suit with a hood, nitrile gloves and eye/face protection such as goggles. Wearing a positive atmosphere personal respirator (PAPR) equipped with P100 air filters is recommended.

CANADIAN REGULATIONS

WHMIS Classification:
Class D2B Toxic material causing other toxic effects Moderate eye irritant Moderate respiratory irritant

WHMIS Symbol:
(16) OTHER INFORMATION

NFPA Classification: Not available.

Full Text of R-phrases in Section 2 & 3: R36/37/38 Irritating to eyes, respiratory system and skin.

Full Text of classification in Section 2 & 3: Xi Irritant

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Version: 1

Date of previous issue: January, 2016

Notice:

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. The information contained herein was not obtained from toxicology assays using our graphene but gathered from literature.