

SAFETY DATA SHEET

Product: Graphene Nanoplatelet Aqueous Dispersion PVP



(1) PRODUCT AND COMPANY IDENTIFICATION

Identification of the substance or preparation

TRADE/MATERIAL NAME: Graphene Nanoplatelet Aqueous Dispersion PVP

CHEMICAL NAME: Graphene Nanoplatelet Aqueous Dispersion PVP

Use of the substance/Preparation: Industrial applications. 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)

OSHA/HCS Status:

While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

GHS Classification

Not classified.

GHS Label elements, including precautionary statements

Signal Word: No signal word.
Hazard Statements: No known significant effects or critical hazards.

Precautionary statement(s):

Prevention : Not applicable.
Response : Not applicable.
Storage : Not applicable.
Disposal : Not applicable.

(3) COMPOSITION/INFORMATION ON INGREDIENTS

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<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>PERCENT</u>	<u>EC NUMBER</u>	<u>EC CLASSIFICATION</u>
<u>Synthetic Graphite</u>	7782-42-5	1-8	231-955-3	Xi R36/37/38
<u>Trace impurities</u>	Not available	0-1	Not available	Not available

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

(4) FIRST AID MEASURES

Eye contact: Remove contact lenses, irrigate copiously with clean, fresh water, holding the eyelids apart for at least 10 minutes and seek immediate medical advice.

Skin contact: Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.

Inhalation: Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.

Ingestion: If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do NOT induce vomiting.

(5) FIRE-FIGHTING MEASURES

Suitable extinguishing media: Use an extinguishing agent suitable for the surrounding fire.

Decomposition products: Decomposition products may include the following materials:
carbon oxides
Lower molecular weight polymer fractions.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

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(6) ACCIDENTAL RELEASE MEASURES

For non-emergency personnel:

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal

For emergency responders:

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For nonemergency personnel".

Environmental precautions:

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for clean-up of small spill:

Stop leak if without risk. Move containers from spill area. Absorb spill with inert material (e.g. dry sand or earth) and place in a chemical waste container. Dispose of via a licensed waste disposal contractor.

Method for clean-up of large spill:

Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with noncombustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.

(7) HANDLING AND STORAGE

Protective measures:

Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene:

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities:

Do not store below the following temperature: 5°C (41°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

(8) EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values for Graphite:

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

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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.

A = Acceptable Maximum Peak

ACGIH = American Conference of Governmental Industrial Hygienists.

C = Ceiling Limit

S Potential skin absorption

SR = Respiratory sensitization

SS = Skin sensitization

TD = Total dust

Consult local authorities for acceptable exposure limits.

TLV = Threshold Limit Value

TWA = Time Weighted Average

F = Fume

IPEL = Internal Permissible Exposure Limit

OSHA = Occupational Safety and Health Administration.

R = Respirable

Z = OSHA 29CFR 1910.1200 Subpart Z - Toxic and Hazardous Substances

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Appropriate engineering controls

Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls:

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection:

Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If workers are exposed to concentrations above the exposure limit, they must use appropriate, certified respirators. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. 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 --

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Part 2: Use of the control banding approach.

Hand protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eye protection: Safety glasses with side shields, such as NIOSH (US) or EN 166 (EU).

Skin protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

(9) PHYSICAL AND CHEMICAL PROPERTIES

General Information: Appearance – black liquid
Odour – None

Important health, safety and environmental information:

pH: 7
Melting point: 0°C (32°F)
Boiling point: 100°C (212°F)
Flash point: Closed cup: Not applicable. [Product does not sustain combustion.]
Explosive properties: Not available
Oxidising properties: Not expected
Vapour pressure: Not applicable
Relative density: 1
Density (lbs / gal) 8.35
Solubility: Partially soluble in the following materials: cold water.
Partition coefficient: Not applicable
Viscosity: Not applicable
Vapour density: Not applicable
Evaporation rate: Not applicable

(10) STABILITY AND REACTIVITY

This product is stable under normal storage conditions.

Conditions to avoid: When exposed to high temperatures may produce hazardous decomposition products. Keep away from the following materials to prevent strong exothermic reactions: oxidizing agents, strong alkalis, strong acids. Refer to protective measures listed in sections 7 and 8.

Materials to avoid: Keep away from the following materials to prevent strong exothermic reactions: oxidizing agents, strong alkalis, strong acids.

Hazardous decomposition products: Decomposition products may include the following materials: carbon monoxide, carbon dioxide, metal oxide/oxides.

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Chemical stability: Stable under recommended storage and handling conditions (see Section 7).

(11) TOXICOLOGICAL INFORMATION

This product contains engineered nanoparticles which have structural features with at least one dimension of 100 nanometers or less. The unique and diverse physiochemical properties of these nanoscale materials may result in toxicological properties that may differ from materials of similar composition but larger size. Ambient particulate air pollution which contains ultrafine particles has been associated with cardiovascular and lung diseases. Presently, very little toxicity data are available regarding exposure to engineered nanoscale materials.

Acute toxicity:

Irritant effect on skin:	There are no data available on the mixture itself.
Irritant effect on the eye:	There are no data available on the mixture itself.
Respiratory or skin sensitization:	There are no data available on the mixture itself.
Inhalation	There are no data available on the mixture itself.
Ingestion	There are no data available on the mixture itself.
Target organs	Contains material which may cause damage to the following organs: lungs, cardiovascular system, upper respiratory tract.

(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.

(14) TRANSPORT INFORMATION

	DOT	IMDG	IATA
UN Number:	Not regulated	Not regulated	Not regulated
UN proper shipping Name:	-	-	-
Transport hazard class (es):	-	-	-
Packing group:	-	-	-
Environmental hazards:	No.	No.	No.
Marine pollutant	Not applicable	Not applicable	Not applicable
Substances:			

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(15) REGULATORY INFORMATION

SARA 304 RQ : Not applicable.

SARA 311/312
Classification : Not applicable.

(16) OTHER INFORMATION

NFPA Classification: Not available.

Date of Issue: April, 2018

Version: 1

Date of previous issue: None

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.