

## SAFETY DATA SHEET

### Section 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

#### 1.1 PRODUCT IDENTIFIER

**Product Name:** xGnP® Graphene Nanoplatelets  
**Product Code:** Not available.

#### 1.2 RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST

**Use:** Additive.

#### 1.3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

**Address:** XG Sciences, Inc.  
 815 Terminal Road  
 Lansing, MI  
 48906  
**Telephone Number:** +00 1 517 703 1110  
**e-mail address for a competent person responsible for the safety data sheet :** [m.knox@xgsciences.com](mailto:m.knox@xgsciences.com)

#### 1.4 EMERGENCY TELEPHONE NUMBER

**Emergency Telephone Number:** ChemTrec International: (202) 483-7616

### Section 2: HAZARDS IDENTIFICATION

#### 2.1 CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

Classification in accordance with the Classification Labeling and Packaging Regulation (EC) No 1272/2008

Hazard class	Hazard Statement
Aquatic environment - Chronic 3 (Aquatic Chronic 3)	H412 Harmful to aquatic life with long lasting effects.

Classification in accordance with the Dangerous Preparations Directive 1999/45/EC

This preparation is classified as not dangerous according to Directive 1999/45/EC.

#### 2.2 LABEL ELEMENTS

Labeling in accordance with the Classification Labeling and Packaging Regulation (EC) No 1272/2008

**Signal Word:** Not applicable.  
**Hazard Statement:** H412 Harmful to aquatic life with long lasting effects.  
**Precaution:** P102 Keep out of reach of children.  
**Prevention:** P262 Do not get in eyes, on skin, or on clothing.  
 P261 Avoid breathing dust/fume/gas/mist/vapours/spray.  
 P273 Avoid release to the environment.  
**Response:** Not applicable.  
**Storage:** Not applicable.

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**Disposal:** P501 Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Additional Hazards:** Not applicable.

### Labeling in accordance with the Dangerous Substances Directive 67/548/EEC

**Physical/Chemical Hazards:** Not applicable.

**Human Health Hazards:** Not applicable.

**Environmental Hazards:** Not applicable.

**Other Hazards:** See section 11 for more detailed information on health effects and symptoms.

### 2.3 OTHER HAZARDS

**PBT & vPvB:** See section 12.5 for more detailed information on PBT and vPvB.

## Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 MIXTURES

#### Classification according to Regulation (EC) No 1272/2008 (CLP)

Ingredient	CAS No	EC No	REACH No	Wt. %	Class
Graphite	7782-42-5	231-955-3	Not available.	95 - 100	Not classified as hazardous.
Sulfur	7704-34-9	231-722-6	Not available.	1 - 5	Skin Irrit. 2 H315

#### Classification according to 67/548/EEC

Ingredient	CAS No	EC No	REACH No	Wt. %	Class
Graphite	7782-42-5	231-955-3	Not available.	95 - 100	Not classified as hazardous.
Sulfur	7704-34-9	231-722-6	Not available.	1 - 5	Xi; R38

Full text of R-, H- and EUH- phrases: see section 16.

## Section 4: FIRST AID MEASURES

### 4.1 DESCRIPTION OF THE FIRST AID MEASURE

**Eye:** In case of contact, immediately flush eyes with plenty of water. Remove contact lenses, if worn. If irritation persists, get medical attention.

**Skin:** In case of contact, immediately flush skin with plenty of soap and water. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician if irritation develops and persists.

**Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If symptoms persist, obtain medical attention.

**Ingestion:** If swallowed, rinse mouth with water. Seek medical attention or call poison control.

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### 4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE & DELAYED

<b>Eye:</b>	May cause eye irritation. Symptoms may include discomfort or pain, excess blinking and tear production, with possible redness and swelling.
<b>Skin:</b>	May cause skin irritation. Symptoms may include redness, edema, drying, defatting and cracking of the skin.
<b>Inhalation:</b>	May cause respiratory tract irritation.
<b>Ingestion:</b>	Not applicable under normal conditions of use.

### 4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENTS NEEDED

<b>Note to Physicians:</b>	Symptoms may not appear immediately.
<b>Specific Treatments:</b>	In case of accident or if you feel unwell, seek medical advice immediately (show the label or MSDS where possible).

## Section 5: FIRE FIGHTING MEASURES

### 5.1 EXTINGUISHING MEDIA

<b>Suitable Extinguishing Media:</b>	Treat for surrounding material.
<b>Unsuitable Extinguishing Media:</b>	Not available.

### 5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

<b>Products of Combustion:</b>	May include, and are not limited to: oxides of carbon.
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### 5.3 ADVICE FOR FIRE FIGHTERS

<b>Protection of Firefighters:</b>	Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).
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## Section 6: ACCIDENTAL RELEASE MEASURES

### 6.1 PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

### 6.2 ENVIRONMENTAL PRECAUTIONS

Keep out of drains, sewers, ditches, and waterways. Minimize use of water to prevent environmental contamination.

### 6.3 METHODS FOR CONTAINMENT AND CLEANING - UP

<b>Methods for Containment:</b>	Contain and/or absorb spill with inert material (e.g. sand, vermiculite), then place in a suitable container. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE).
<b>Methods for Cleaning-Up:</b>	Vacuum or sweep material and place in a disposal container. Avoid generating dust. Spills of this material are a slipping hazard.

### 6.4 REFERENCES TO OTHER SECTIONS

See section 8 for further information on protective clothing and equipment and section 13 for advice on waste disposal.

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### Section 7: HANDLING & STORAGE

#### 7.1 PRECAUTIONS FOR SAFE HANDLING

- Handling:** Avoid contact with skin and eyes. Keep away from sources of ignition. Avoid generating dust as the product may form explosive dust/air mixtures. Good housekeeping is important to prevent accumulation of dust. Graphite is electronically conductive; care should be taken to avoid accumulation of dust / powder where it may cause electrical shorting. Use only in well-ventilated areas. When using do not eat or drink. (See section 8)
- General Hygiene Advice:** Wash hands before eating, drinking, or smoking. Launder contaminated clothing before re-use.

#### 7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

- Storage:** Keep out of the reach of children. Keep container tightly closed and dry. Do not store at temperatures above 49 °C / 120 °F. (See section 10)

#### 7.3 SPECIFIC END USES(S)

- End uses:** Not available.

### Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

#### 8.1 CONTROL PARAMETERS

Ingredient	UK - Occupational Exposure Limits (TWA)
Graphite	30 mg/m <sup>3</sup> STEL (calculated, inhalable dust); 12 mg/m <sup>3</sup> STEL (calculated, respirable dust) 10 mg/m <sup>3</sup> TWA (inhalable dust); 4 mg/m <sup>3</sup> TWA (respirable dust)
Sulfur	Not available.

#### 8.2 EXPOSURE CONTROLS

- Engineering Controls:** Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, etc.) below recommended exposure limits.
- Personal Protective Equipment:**
- Eye/Face Protection:** Wear eye/face protection.
- Skin Protection:**
- Hand Protection:** Wear suitable gloves.
- Body Protection:** Wear suitable protective clothing.
- Respiratory Protection:** Wear appropriate NIOSH approved dust mask or filtering facepiece if dust is generated.
- General Health & Safety Measures:** Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking. Ensure that eyewash stations and safety showers are close to the workstation location.
- Environmental Exposure Controls:** Maintain levels below Community environmental protection thresholds.

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### Section 9: PHYSICAL & CHEMICAL PROPERTIES

#### 9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Powder.
<b>Color:</b>	Grey or black.
<b>Odour:</b>	Odourless.
<b>Odour Threshold:</b>	Not available.
<b>Physical State:</b>	Solid.
<b>pH:</b>	Not available.
<b>Melting Point:</b>	Not available.
<b>Boiling Point:</b>	Not available.
<b>Flash Point:</b>	Not available.
<b>Evaporation Rate:</b>	Not available.
<b>Flammability:</b>	Not available.
<b>Lower Flammability/Explosive Limit:</b>	Not available.
<b>Upper Flammability/Explosive Limit:</b>	Not available.
<b>Vapor Pressure:</b>	Not available.
<b>Vapor Density:</b>	Not available.
<b>Relative Density:</b>	Not available.
<b>Solubility:</b>	Negligible.
<b>Partition coefficient: n-octanol/water:</b>	Not available.
<b>Auto-ignition Temperature:</b>	Not available.
<b>Decomposition Temperature:</b>	Not available.
<b>Viscosity:</b>	Not available.
<b>Explosive Properties:</b>	Not available.
<b>Oxidizing Properties:</b>	Not available.

#### 9.2 OTHER INFORMATION

Not available.

### Section 10: STABILITY & REACTIVITY

#### 10.1 REACTIVITY

No dangerous reaction known under conditions of normal use.

#### 10.2 CHEMICAL STABILITY

Stable under normal storage conditions.

#### 10.3 POSSIBILITY OF HAZARDOUS REACTIONS

No dangerous reaction known under conditions of normal use.

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### 10.4 CONDITIONS TO AVOID

Heat. Incompatible materials.

### 10.5 INCOMPATIBLE MATERIALS

Strong oxidizers. Chlorine trifluoride. Fluorine.

### 10.6 HAZARDOUS DECOMPOSITION PRODUCTS

May include, and are not limited to: oxides of carbon.

## Section 11: TOXICOLOGY INFORMATION

### 11.1 INFORMATION ON TOXICOLOGICAL EFFECTS

**Likely Routes of Exposure:** Skin contact, eye contact, and inhalation.

**Acute Health Effects:**

**Eye:** May cause eye irritation. Symptoms may include discomfort or pain, excess blinking and tear production, with possible redness and swelling.

**Skin:** May cause skin irritation. Symptoms may include redness, edema, drying, defatting and cracking of the skin.

**Ingestion:** Not applicable under normal conditions of use.

**Inhalation:** May cause respiratory tract irritation.

**Acute Toxicity:**

Ingredient	LC50	LD50
Graphite	Not available.	Not available.
Sulfur	Inhalation LC50 Rat >9.23 mg/L 4 h	Oral LD50 Rat >3000 mg/kg; Dermal LD50 Rabbit >2000 mg/kg

\*99 percent of the mixture consists of ingredient(s) of unknown toxicity.

**Skin Corrosion/Irritation:** Dust may cause skin irritation.

**Serious Eye Damage/Irritation:** Dust may cause eye irritation.

**Respiratory or Skin Sensitization:** Although this product has not been tested, it is not expected to have sensitizing potential, based on the absence of effects with the constituents.

**STOT-Single Exposure:** Based on available data, the classification criteria are not met.

**Chronic Health Effects:** No known significant effects or critical hazards.

**Carcinogenicity:** This product is not classified as a carcinogen.

**Germ Cell Mutagenicity:** This product is not classified as a mutagen.

**Reproductive Toxicity:**

**Developmental:** This product does not contain known reproductive or developmental toxins.

**Fertility:** No known significant effects or critical hazards.

**STOT-Repeated Exposure:** None identified.

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**Aspiration Hazard:** Not expected to occur.

**Other Information:** Not available.

### Section 12: ECOLOGICAL INFORMATION

#### 12.1 TOXICITY

**Acute/Chronic Toxicity:** No ecological data on the product itself is available.

**Ingredient**

**Aquatic Toxicity**

Graphite

Not available.

Freshwater fish: 96 Hr LC50 Brachydanio rerio: 866 mg/L [static];  
96 Hr LC50 Lepomis macrochirus: <14 mg/L [static]; 96 Hr LC50  
Oncorhynchus mykiss: >180 mg/L [static]

Sulfur

Contains 99 % of components with unknown hazards to the aquatic environment.

#### 12.2 PERSISTENCE & DEGRADABILITY

Not available.

#### 12.3 BIOACCUMULATIVE POTENTIAL

**Bioaccumulation:** Not available.

#### 12.4 MOBILITY IN SOIL

Not available.

#### 12.5 RESULTS OF PBT AND vPvB ASSESSMENT

**PBT results:** A PBT assessment has not yet been carried out under REACH for the constituents. However, there are no indications that this product contains substances likely to be classified as PBT.

**vPvB results:** A vPvB assessment has not yet been carried out under REACH for the constituents. However, there are no indications that this product contains substances likely to be classified as vPvB.

#### 12.6 OTHER ADVERSE EFFECTS

No other known adverse effects.

### Section 13: DISPOSAL CONSIDERATIONS

#### 13.1 WASTE TREATMENT METHODS

**Disposal Method:** This material must be disposed of in accordance with all local, state, provincial, and federal regulations.

**Other disposal recommendations:** Not available.

### Section 14: TRANSPORTATION INFORMATION

#### 14.1 UN NUMBER

Not regulated.

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### 14.2 UN PROPER SHIPPING NAME

Not applicable.

### 14.3 TRANSPORT HAZARD CLASS(ES)

Not applicable.

### 14.4 PACKING GROUP

Not applicable.

### 14.5 ENVIRONMENTAL HAZARDS

Not available.

### 14.6 SPECIAL PRECAUTIONS FOR USER

Not available.

### 14.7 TRANSPORT IN BULK ACCORDING TO ANNEX II OF MARPOL 73/78 AND THE IBC CODE

Not available.

## Section 15: REGULATORY INFORMATION

### 15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/ LEGISLATIONS SPECIFIC FOR THE SUBSTANCE OR MIXTURE

#### Authorizations and/or restrictions on use:

All components are listed as existing substances in Europe.

### 15.2 CHEMICAL SAFETY ASSESTMENT

A Chemical Safety Assessment has not been carried out for this product.

## Section 16: OTHER INFORMATION

**Date of Preparation:** September 28, 2011  
**Version:** 1  
**Revision Date:** September 28, 2011  
**Revised Changes:** None.

**Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:**

<u>Classification</u>	<u>Classification Procedure</u>
Aquatic environment - Chronic 3 (Aquatic Chronic 3)	Calculation method.

#### Relevant R-, H- and EUH- Phrases:

H412 Harmful to aquatic life with long lasting effects.  
P102 Keep out of reach of children.  
P262 Do not get in eyes, on skin, or on clothing.  
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.  
P273 Avoid release to the environment.

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P501 Dispose of contents and container in accordance with all local, regional, national and international regulations.

### Legend:

PBT - Persistent, Bioaccumulative and Toxic

vPvB - very Persistent and very Bioaccumulative

CAS No - Chemical Abstracts Service Number

EC No - European Commission Number

REACH No - Registration, Evaluation, Authorisation and restriction of Chemicals Number

STOT Specific target organ toxicity

$\log K_{ow}$  - Partition coefficient n-octanol/water

BCF - Bioconcentration Factor

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**Prepared by:** Nexreg Compliance Inc.  
Phone: (519) 488-5126  
[www.nexreg.com](http://www.nexreg.com)

**Prepared for:** XG Sciences, Inc

### End of Safety Data Sheet