

# MATERIAL SAFETY DATA SHEET

xGnP® Graphene Nanoplatelets – IPA Dispersions

## Section 1: PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** xGnP® Graphene Dispersions – Isopropyl Alcohol  
**Product Use:** Additive  
**Manufacturer/Supplier:** XG Sciences, Inc.  
3101 Grand Oak Drive  
Lansing, MI  
48911  
**Phone Number:** 517-703-1110  
**Emergency Phone:** ChemTrec USA: (800) 424-9300  
ChemTrec International: (+)1 (703) 527-3877  
**Date of Preparation:** February 6, 2013

## Section 2: HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW

**OSHA Hazards:** Flammable Liquid, Target Organ Effect, Irritant

**Target Organs:** Nerves, Kidney, Cardiovascular system, Gastrointestinal track, Liver, Skin, Eyes, Respiratory system

### GHS Classification:

Flammable liquids (Category 2)  
Skin irritation (Category 3)  
Eye irritation (Category 2a)  
Specific target organ toxicity – single exposure (Category 3)

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

Eye: Causes eye irritation

Skin: May cause skin irritation

Ingestion: May be harmful if swallowed

Inhalation: May cause respiratory tract irritation. Vapors may cause drowsiness and dizziness

**Chronic Effects:** Prolonged or repeated contact may dry skin and cause irritation.

**Medical Conditions Aggravated By Exposure:** Asthma, Allergies

**HMIS Classification Health Hazard:** 2

**Chronic Health Hazard:** \*

**Flammability:** 3

**Physical Hazards:** 0

**Reactivity** 1

**NFPA Rating:**

**Health hazard:** 2

**Fire:** 3

**Reactivity Hazard:** 1

**Potential Environmental Effects:** May cause long-term adverse effects in the aquatic environment. See Section 12 for more information.

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## Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	CAS #	Wt. %
Isopropyl Alcohol (2-Propanol)	67-63-0	75-85
Graphite	7782-42-5	15-25

## Section 4: FIRST AID MEASURES

**General Advice:** In case of accident or if you feel unwell, seek medical advice immediately (show the label or MSDS where possible).

**Inhalation:** If vapors are breathed in, move person to fresh air. If not breathing, give artificial respiration. Consult a physician

**Eye Contact:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if worn. If irritation persists, get medical attention.

**Skin Contact:** 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.

**Swallowed:** **Do Not** induce vomiting. Rinse mouth with water. Consult a physician.

**Note to Physicians:** Symptoms may not appear immediately.

## Section 5: FIRE FIGHTING MEASURES

**Flammability:** Flammable in the presents of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

**Means of Extinction:** Use water spray, alcohol resistant foam, dry chemical or carbon dioxide.

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

**Protection of Firefighters:** Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).

**Further Information:** Use water spray to cool unopened containers.

## Section 6: ACCIDENTAL RELEASE MEASURES

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

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

**Methods for Containment:** Contain spill, then place in a suitable container. Minimize dust generation. Do not flush to sewer or allow to enter waterways. Use appropriate Personal Protective Equipment (PPE).

**Methods for Clean-Up:** Vacuum (electrically protected) or sweep material and place in a disposal container. Avoid generating dust. Spills of this material are a slipping hazard. Dispose of according to local regulations (see section 13)

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## Section 7: HANDLING AND STORAGE

### Handling:

Avoid contact with skin and eyes. Keep away from sources of ignition. Flash back is possible over considerable distance. Container explosion may occur under fire conditions. Use explosion proof equipment. Keep away from sources of ignition. Avoid drying and generating dust as the product may form explosive dust/air mixtures. Good housekeeping is important to prevent accumulation of dust. Graphite is electrically conductive; care should be taken to avoid accumulation of dust / powder where it may cause electrical shorting. Use only in well-ventilated areas. Launder contaminated clothing before reuse. When using do not eat or drink. Wash hands before eating, drinking, or smoking.

### Storage:

Keep out of the reach of children. Keep container tightly closed and dry. Store in a well ventilated place.

## Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure Guidelines

Ingredient	Exposure Limits	
	OSHA-PEL	ACGIH-TLV
Isopropyl Alcohol	400 ppm – 980mg/m <sup>3</sup>	200 ppm
Graphite	15 mg/m <sup>3</sup> (synthetic, total dust); 5 mg/m <sup>3</sup> (synthetic, Respirable fraction)	2 mg/m <sup>3</sup>

**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.

**Hand Protection:** Wear suitable gloves.

**Skin and Body Protection:** Wear suitable protective clothing.

**Respiratory Protection:** Wear appropriate NIOSH approved dust mask or filtering facepiece if materials is dried dust is generated.

**General Hygiene Considerations:** Handle according to established industrial hygiene and safety practices. Wash hands before breaks and at the end of the work day.

## Section 9: PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Mud or Paste
<b>Color:</b>	Gray or black.
<b>Odour:</b>	Alcohol-like
<b>Odour Threshold:</b>	Not available.
<b>Physical State:</b>	Paste.
<b>pH:</b>	6-8

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<b>Viscosity:</b>	Not applicable.
<b>Freezing Point:</b>	Not applicable.
<b>Boiling Point:</b>	82°C (180°F)
<b>Flash Point:</b>	12°C (53.6°F) – closed cup.
<b>Autoignition Temperature:</b>	425°C (797°F)
<b>Evaporation Rate:</b>	3
<b>Lower Flammability Limit:</b>	2% (V)
<b>Upper Flammability Limit:</b>	12.7% (V)
<b>Vapor Pressure:</b>	43.2 hPa at 2°C
<b>Vapor Density:</b>	Not applicable.
<b>Bulk Density:</b>	0.9 – 1.0 g/cm <sup>3</sup>
<b>Specific Gravity:</b>	Not available.
<b>Solubility in Water:</b>	Not available
<b>VOC content, wt. %:</b>	75 -85%

## Section 10: STABILITY AND REACTIVITY

**Stability:** Stable under normal storage conditions. May form peroxides of unknown stability

**Conditions to Avoid** Heat, flames, sparks. Incompatible materials. Vapors may form explosive mixtures

**Incompatible Materials:** Strong oxidizers. Chlorine trifluoride. Fluorine. Aluminum.

**Hazardous Decomposition Products:** May include, and are not limited to: oxides of carbon.

**Possibility of Hazardous Reactions:** No dangerous reaction known under conditions of normal use.

## Section 11: TOXICOLOGY INFORMATION

### EFFECTS OF ACUTE EXPOSURE

#### Component Analysis

<b>Ingredient</b>	<b>LD<sub>50</sub> (oral)</b>	<b>LC<sub>50</sub></b>
Isopropyl Alcohol	>5000mg/kg, rat	16000 ppm rat-8h
Graphite	> 2000mg/kg, rat	Not available.

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

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

### EFFECTS OF CHRONIC EXPOSURE

**Target Organs:** May cause drowsiness or dizziness.

**Chronic Effects:** No data available.

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**Carcinogenicity:** Not hazardous by WHMIS/OSHA criteria.

## Ingredient

Isopropyl Alcohol  
Graphite

## Chemical Listed as Carcinogen or Potential Carcinogen \*

Not classifiable  
Not listed.

\* See Section 15 for more information.

**Mutagenicity:** No data available.

**Reproductive Effects:** No data available.

## Developmental Effects:

**Teratogenicity:** No data available.

**Embryotoxicity:** No data available.

**Respiratory Sensitization:** No data available.

**Skin Sensitization:** May cause skin irritation.

**Toxicologically Synergistic Materials:** Not available.

## Section 12: ECOLOGICAL INFORMATION

### Ecotoxicity:

Toxicity to fish: LC50- Pimephales promelas (fathead minnow) – 9,640 mg/l – 96 h  
Toxicity to daphnia EC50 -Daphnia magna (water flea) – 5,102 mg/L – 24 h  
and other aquatic invertebrates Immobilization EC50- Daphnia magna (water flea) – 6,851 mg/L – 24 h  
Toxicity to algae EC50 –Desmodesmus subspicatus (green algae) – >2,000 mg/L – 72 h  
EC50 – Algae ->1,000 mg/L – 24 h

**Persistence / Degradability:** Not available.

**Bioaccumulation / Accumulation:** Not available.

**Mobility in Environment:** Not available.

## Section 13: DISPOSAL CONSIDERATIONS

### Disposal Instructions:

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

## Section 14: TRANSPORTATION INFORMATION

### DOT Classification

Not classified. Ship as Isopropyl alcohol  
UN number 1219 Class 3 Packing Group II  
Proper shipping name: isopropanol

### IMDG

Not classified. Ship as Isopropyl alcohol  
UN number 1219 Class 3 Packing Group II EMS-No. F-E, S-D  
Proper shipping name: isopropanol

### IATA

Not classified. Ship as Isopropyl alcohol  
UN number 1219 Class 3 Packing Group II  
Proper shipping name: isopropanol

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## Section 15: REGULATORY INFORMATION

### OSHA Hazards

Flammable liquid, Target Organ Effect, Irritant

### SARA Title III

#### Ingredient

#### Section 302 (EHS) TPQ (lbs.)

#### Section 304 EHS RQ (lbs.)

#### CERCLA RQ (lbs.)

#### Section 313

Isopropyl Alcohol

Not listed.

Not listed.

Not listed.

listed.

Graphite

Not listed.

Not listed.

Not listed.

Not listed.

**SARA 311/314 Hazards:** Fire Hazard, Acute Health Hazard, Chronic Health Hazard.

### State Regulations:

**Massachusetts Right to Know Components** – 2-Propanol CAS-No. 67-63-0

**Pennsylvania Right to Know Components** – 2-Propanol CAS-No. 67-63-0

**New Jersey Right to Know Components** – 2-Propanol CAS-No. 67-63-0

### California Proposition 65:

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

### HMIS - Hazardous Materials Identification System

Health - 2

Flammability - 3

Physical Hazard - 0

PPE – B

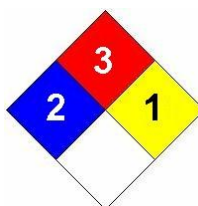
### NFPA - National Fire Protection Association:

Health - 2

Fire - 3

Reactivity – 1

HEALTH	2
FLAMMABILITY	3
PHYSICAL HAZARD	0
PERSONAL PROTECTION	B



**Hazard Rating:** 0 = minimal, 1 = slight, 2 = moderate, 3 = severe, 4 = extreme

## Section 16: OTHER INFORMATION

### Disclaimer:

The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for the user's own particular use.

**Expiry Date:** January 30, 2015

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