

Material Safety Data Sheet

1. PRODUCT AND COMPANY INFORMATION

Product name : Graphene Oxide solution
Company : Graphene Square Inc.
Address : Bldg, 503-326 Gwanak-ro Gwanak-gu, Seoul 151-742, Republic of Korea
Telephone : +82 2 880 6569
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Web site : www.graphenesq.com
E-mail : info@graphenesquare.com

Recommended use of the chemical and restrictions on use

Recommended use : Experimental research
Restrictions on use : No data available

2. HAZARDS IDENTIFICATION

Globally Harmonized System of Classification and Labelling of Chemicals(GHS)

Physical hazard : Not applicable
Health hazard : Not applicable
Environment hazard : Not applicable

Label elements including precautionary statements

Symbol : Not applicable
Signal word : Not applicable
Hazard statements : Not applicable
Precautionary statements : Not applicable

NFPA Rating

Health : 0 Flammability : 0 Reactivity : 0 Water reactivity : 0

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredients | CAS No. | EINECS No. | Conc. % |
|----------------|-----------|------------|---------|
| Water | 7732-18-5 | 231-791-2 | 99.9 % |
| Graphene oxide | - | - | 0.1 % |

4. FIRST AID MEASURES

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

In case of skin contact

Wash off with soap and plenty of water.

If inhaled

If not breathing, give artificial respiration.

If swallowed

Never give anything by mouth to an unconscious person.

Rinse mouth with water.

Other medical attention.

Medical personnel should be aware of the protective measures of the substance.

Potential health effect

May be harmful if swallowed.

5. FIRE-FIGHTING MEASURES

Flammable properties

Flash point : No flash occurred under 93 °C (Tag closed cup)

Flash point : No flash occurred under 250 °C (Cleveland open cup)

Autoignition temperature : No spontaneous combustion under 500 °C

Suitable extinguisher

Water spray, alcohol-resistant foam, dry chemical, carbon dioxide

Specific hazards arising from the chemical

No data available

Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Avoid breathing mist.

Ensure adequate ventilation.

Environmental precautions

Don't dispose the product into drainages.

Methods and materials for containment and cleaning up

Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Prevent to spill.

Conditions for safe storage

Stable under general condition.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Components with workplace control parameter

KOSHA : No data available

US OSHA : No data available

Appropriate engineering controls : No data available

Personal protective equipment

Respiratory protection : Dust mask

Hand protection : Protective gloves

Eye protection : Protective goggles

Skin and body protection : Working clothes

9. PHYSICAL AND CHEMICAL PROPERTIES

State : Liquid at 20 °C

Flash point

No flash occurred under 93 °C (Tag closed cup)

No flash occurred under 250 °C (Cleveland open cup)

Autoignition temperature : No spontaneous combustion under 500 °C

pH : 3.11 at 20 °C

Boiling point (Initial) : > 100 °C

Viscosity : 1.3 mPa · s (cP) at 20 °C

Density : 1.000 at 20 °C

Water solubility : Soluble at 20 °C

Explosive properties

No self-reaction hazard ※ UN TDG test & criteria - Test E3

Freezing range (Initial) : No data available

Vapour pressure : No data available

Oxidizing properties : No data available

Decomposition temperature : No data available

Partition coefficient (n-octanol/water) : No data available

Evaporation rate : No data available

Lower explosion limit : No data available

Upper explosion limit : No data available

10. STABILITY AND REACTIVITY

Chemical stability

Stable under general condition.

Conditions to avoid

No data available

Materials to avoid

Substances which, in contact with water, emit flammable gases

Hazardous decomposition products

No data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

| | | | |
|------------|--------|--------------------------|------------------------|
| Oral | rat | LD50 : > 2,000 mg/kg | ※ from IUCLID / US NLM |
| Skin | rabbit | LD50 : No data available | |
| Inhalation | rat | LC50 : No data available | |

Skin irritation : No data available

Eye irritation : No data available

Respiratory sensitization : No data available

Skin sensitization : No data available

Carcinogenicity : Not classifiable ※ from CCRIS / IARC / EC ESIS

Reproductive toxicity : No data available

Specific target organ toxicity – single exposure (GHS) : No data available

Specific target organ toxicity – repeated exposure (GHS) : No data available

Aspiration hazard : No data available

12. ECOLOGICAL INFORMATION

Toxicity

| | | |
|------|--------------------------|------------------------|
| Fish | LC50 : > 100 mg/L – 96 h | ※ from IUCLID / US NLM |
|------|--------------------------|------------------------|

Crustacean EC50 : No data available

Algae EC50 : No data available

Persistence and degradability : No data available

Bioaccumulative potential : No data available

Mobility in soil : No data available

Other adverse effects : No data available

13. DISPOSAL CONSIDERATIONS

Disposal consideration

Observe all environmental regulations.

Disposal precaution : No data available

14. TRANSPORT INFORMATION

UN TDG : Not dangerous goods

IMDG : Not dangerous goods

IATA : Not dangerous goods

Marine pollution : Not applicable

Special precaution

Fire EmS Guide (Recommendation) : F-A

Spillage EmS Guide (Recommendation) : Not dangerous goods

15. REGULATORY INFORMATION

Korea Industrial Safety and Health Act (GHS) : Not applicable

Korea Hazardous Materials Safety Control Act : Not hazardous material

Korea Toxic Chemicals Control Act : Not toxic chemical

Korea Persistent Organic Pollutants Control Act : Not applicable

US OSHA Hazard : Not applicable

16. OTHER INFORMATION

Issued Date : 2012. 06. 26

Revision No. : 0

Revision Date : 2012. 06. 26

References

- GHS Classification :

Korea MSDS Testing Lab Certificate (Report No. 2012-03-06-187), IUCLID, EC ESIS

- Physical and chemical properties : Korea MSDS Testing Lab Certificate

- Transport information : Korea MSDS Testing Lab Certificate

- Toxic & ecological information : OECD SIDS, IUCLID, US NLM, IARC, EC ESIS, CCRIS,

※ Hazards Testing and Classification

Korea MSDS Testing Laboratory

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This MSDS is composed in line with The Korea Occupational Safety and Health Act Article 41 to protect the health of the employees, and for documentation.

This MSDS is composed with reference to documents and criteria provided by KOSHA.

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