



SHOWA DENKO K.K.

GPS/JIPS Safety Summary

1. SUBSTANCE NAME

Graphite Electrodes

2. GENERAL STATEMENT

A graphite electrode is a component used as an electrode of electrical steel furnaces that produce steel by fusing iron scraps. Electrical steel furnaces fuse iron scraps through arc discharges by applying large electrical currents. The temperature of fused steel inside the furnace is 1,600°C, while the temperature at the tip of the electrode is as high as 3,000°C. Currently, graphite is the only industrial material that may be used under such severe temperatures. The substance is thermally stable, and maintains stability in the presence of acids and alkalis.

3. CHEMICAL IDENTITY

The substance is a black-colored and odorless solid that does not dissolve in water. It rarely gasifies at the room temperature (20°C), but has the potential to induce a dust explosion when mixed with the air in a powdery or granular form.

Item	Description
Chemical or generic name	Graphite
Chemical Substance name	Carbon
CAS No.	7782-42-5
Other Nos.	Japan: Chemical Substances Control Law Not applicable EC No./EINECS No.: 231-955-3
Chemical formula	C
Sources/references	Sections 3 of the SDS issued by SHOWA DENKO K.K.

4. USES AND APPLICATIONS

Main uses	The product is used as an electrode for electrical steel furnaces which produce steel through fusing iron scraps.
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5. PHYSICAL/CHEMICAL PROPERTIES

Appearance	Solids
Color	Black
Odor	Odorless
Density	1.4 to 1.9 g/cm ³

Melting point	Not liquefied under normal pressure, but sublimation (sublimation temperature: about 3,650°C)
Lower and upper Flammability limits	No reliable data available.
Auto-ignition temperature	No reliable data available.
Vapor pressure	No reliable data available.
Solubility in water	Non-soluble
Partition coefficient (n-octanol/water)	No reliable data available.
Stability	It is a strong reductive agent that reacts with oxidizing agents.
Sources/references	Section 9 and 10 of the SDS issued by SHOWA DENKO K.K.

6. HEALTH EFFECTS

The substance could damage the bronchia, skin, eyes, mucosa membranes and lungs if exposed to its high-density dust repeatedly over a long period.

Effect assessment	Results (GHS ^(Note 1) hazard classification)
Acute toxicity (oral)	Classification not possible ^(Note 2)
Acute toxicity (dermal)	Classification not possible
Acute toxicity (inhalation; gases)	Not applicable ^(Note 3)
Acute toxicity (inhalation; vapor)	Not applicable
Acute toxicity (inhalation; dust/mist)	Classification not possible
Skin corrosion/irritation	Classification not possible
Serious eye damage/eye irritation	Classification not possible
Respiratory sensitization	Classification not possible
Skin sensitization	Classification not possible
Germ cell mutagenicity	Classification not possible
Carcinogenicity	Classification not possible
Reproductive toxicity	Classification not possible
Specific target organ toxicity (single exposure)	Classification not possible
Specific target organ toxicity (repeated exposure)	Classification not possible
Aspiration hazard	Classification not possible
Sources/references	Sections 11 of the SDS issued by SHOWA DENKO K. K.

(Note 1) GHS (Globally Harmonized System of Classification and Labeling of Chemicals): It is a system for classifying chemicals according to type and hazard level, and for indicating label information pursuant to the globally unified rules for offering Safety Data Sheets.

(Note 2) Classification not possible: when unable to classify due to a lack of sufficiently reliable data for defining the classification.

(Note 3) Not applicable: when chemicals do not fall within the scope of classification because the physical properties defined in the GHS do not apply.

7. ENVIRONMENTAL EFFECTS

Effect assessment	Results (GHS hazard classification)
Hazardous to the aquatic environment	

Acute hazard	Classification not possible
Long-term hazard	Classification not possible
Hazardous to the ozone layer	Montreal Protocol on Substances that Deplete the Ozone Layer (revised version): not included in the list
Sources/references	Sections 12 of the SDS issued by SHOWA DENKO K.K.

Environmental fate/dynamics	Results
Mobility in soil	No reliable data available.
Persistence/degradability	No reliable data available.
Bioaccumulation potential	No reliable data available.
Conclusion about PBT/vPvB	The criteria for persistent bioaccumulative and toxic (PBT; remaining persistently in the environment and possessing high bioaccumulation potential and toxicity) and very persistent and very bioaccumulative (vPvB; remaining very persistently in the environment and possessing very high bioaccumulation potential) chemicals are believed to inapplicable.

8. EXPOSURE

	Exposure potentials through main uses
Occupational exposures	When handling powders of the substance under normal temperatures, workers could be exposed through oral ingestion, contact with the skin, or inhalation if dust is generated during mixing/blending, measuring, packing, unpacking and other processes involving the substance. Harmful effects have been recognized mainly when the substance's high-density dust was inhaled. This may cause coughing and shortness of breath. Additionally, the substance could cause irritation in direct contact with the respiratory tracts, eyes and skin. However, the harmful effects resulting from oral intake of the substance are believed to be minor.
Consumer exposures	The substance is not used by general consumers. There is the potential that consumers could be exposed through dermal and inhalation exposure if dust is generated during handling powders. Harmful effects have been recognized mainly when its high-density dusts were inhaled, and this could cause coughing and shortness of breath. The substance could also irritate respiratory tracts, as well as the eyes and skin upon direct contact. The harmful effects resulting from oral ingestion are believed to be minor.
Environmental exposures	Although environmental exposure is possible in the following cases, no specific effects on the environment have been reported, as mentioned in Section 7 Environmental Effects.
Precautions	If there is the potential for exposure during use in other applications, please implement appropriate measures by referring to the risk management recommendations.

9. RISK MANAGEMENT RECOMMENDATIONS

	Risk management recommendations
Occupational exposures	Technical measures Carry out exhaust ventilation in order to keep a concentration of the substance in the air below the exposure limit value. Install eyewash fountains and safety showers at manufacturing places where the product is stored or handled.
	Local exhaust and total ventilation For controlling and restricting environmental concentrations below the following recommended values, install local exhaust or total ventilation systems at places where the product is manufactured or handled.
	Allowable exposure limit With regard to the product, the Japan Society for Occupational Health published (in 2012) the recommendation values as occupational exposure limits of 0.5 mg/m ³ for respirable dust (class 1 dusts) and 2 mg/m ³ for total dust (class 1 dusts), while the American Conference of Governmental Industrial Hygienists (ACGIH) published (in 2012) the threshold limit value of 2 mg/m ³ (time-weighted average; TLV-TWA). Implement management and control measures to keep its dust concentration below these values.
	Protective equipment While working, wear appropriate protective eyewears, dust-proof masks, air-supplied respirators, clothes and protective gloves made of materials impermeable to powders.
	Precautions Managers are asked to provide workers training concerning the selection and use of appropriate protective equipment, worksite management, etc. Recover the substance promptly to prevent the floor slippery when it leaks on the floor and others.
	Consumer exposures If dusts have been generated, take a precaution not to inhale its dusts and not to directly contact with its dusts on the human body. If the exposure amount is large, implement risk management measures similar to those indicated in "Occupational Exposures" above.
	Environmental exposures In order to prevent environmental exposures, implement preventive measures against leakage into rivers, water channels, and sewerage trenches, and pay attention to the daily management and handling of the substance.
Sources/references	Section 6,7 and 8 of the SDS issued by SHOWA DENKO K.K.

10. STATE AGENCY REVIEW

Hazard assessment	Situations of review
International Chemical Safety Cards	ICSC No. :0893, http://www.ilo.org/dyn/icsc/showcard.display?p_lang=en&p_card_id=0893

11. REGULATORY INFORMATION/GHS CLASSIFICATION-LABELING INFORMATION**Regulatory information only in Japan**

Applicable laws	Regulatory situations
Foreign Exchange and Foreign Trade Act	Item (2), Appended Table 1-16 of Export Trade Control Order
UN classification	Not applicable

GHS classification, label information

Classification results (hazard information)	
"Classification not possible" or "Not applicable"	
GHS label elements	
Pictogram or symbol	None
Signal word	None
Hazard statement	None

12. CONTACT INFORMATION

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13. DATE OF ISSUE AND REVISION, ADDITIONAL INFORMATION

Date of issue: November 26, 2013

Revisions:

Date of revision	Revised section	Revised item	Version

Special instructions: none

14. DISCLAIMER

This Safety Summary which is a translation of original Safety Summary prepared in Japanese, has been prepared as a part of the efforts by GPS/JIPS: Japan Initiative of Product Stewardship by the chemical industry. This Safety Summary is meant to provide an outline of information related to the safe handling of the subject substance rather than provide expert information regarding the risk assessment processes, the effect on human health or the environment, etc. Moreover it is not a replacement for the Safety Data Sheet (SDS), the Chemical Safety Report (CSR), or other risk assessment documents. To the greatest extent possible, the Safety Summary contains accurate statements based on laws, materials, information and other data available at the time of issue. However, it does not cover all such data. Additionally, it does not intend to provide a guarantee in any way.