

Revision: 000

Date: 8 February 2005

1. IDENTIFICATION OF THE SUBSTANCE AND COMPANY UNDERTAKING

General Chemical Name Tungsten silicide powder

Intended/recommended use: Research

Supplier (Distributor): New Metals & Chemicals Ltd.
Newmet House, Rue de St. Lawrence
Waltham Abbey, Essex, EN9 1PF
Telephone +44 (0)1992 711111

2. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredient Name | Concentration | Classification* | CAS number | EINECS No. |
|--------------------------|---------------|-----------------|------------|------------|
| ----- | | | | |
| Tungsten silicide powder | 100% | Xi: R36/37/38 | 12039-88-2 | 234-909-0 |

*see 16. OTHER INFORMATION for full text of R-phrases.

3. HAZARD IDENTIFICATION

Irritating to eyes, respiratory system and skin.

4. FIRST AID MEASURES

Inhalation If signs/symptoms like coughing or burning occur, remove person from exposure to fresh air immediately and administer 100 percent humidified supplement oxygen with assisted ventilation as required. If breathing has ceased DO NOT use mouth-to-mouth respiration. Apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. Seek immediate medical attention.

Skin Contact Flush skin with large amounts of water. Remove contaminated clothing.

If irritation persists, seek medical attention

Eye Contact DO NOT allow patient to rub or keep eyes closed. Irrigate with copious quantities of water for at least 15 minutes. Flush under eyelids by lifting lid. DO NOT use a static eye bath. Seek immediate medical attention.

Ingestion DO NOT induce vomiting. If patient is conscious and alert, wash out mouth with water. Give 2 cupfuls of milk with great care. Give nothing by mouth if patient is unconscious. Seek immediate medical attention.

5. FIRE FIGHTING MEASURES

Precautions against fire and explosion

Material is non-flammable Use fire fighting measures that suit the environment

Extinguishing media which must not be used for safety reasons

None.

Exposure hazards arising from substance, combustion products, resulting gases

Tungsten oxide particles may be formed in fire which are irritant and toxic.

Special protective equipment for fire fighters

Wear full protective clothing, including self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:

Evacuate all but essential authorised control personnel. Wear self-contained breathing apparatus and gloves to avoid inhalation, skin and eye contact. Provide sufficient ventilation.

Environmental Precautions

Prevent entry into drains, surface and ground water, soil and confined areas.

Methods for Cleaning up

Only trained, authorised personnel should be involved. Fully encapsulating protective clothing and self contained breathing apparatus should be worn for spills and leaks with no fire. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Stop leak if you can do it without risk. Keep combustibles (wood, paper, oil etc) away from spilled material. Cover spills with dry sand, dry diatomaceous earth or dry salt followed with plastic sheet to minimise spreading. Collect material and place it into loosely covered plastic containers, suitably marked, and dispose of through a licensed disposal contractor.

Flush spill site with water after material pick up is complete and prevent from entering drains.

7. HANDLING AND STORAGE

Precautions for safe handling

To be handled by qualified and trained staff only. Avoid breathing dusts and direct contact with skin and eyes. Wash hands thoroughly after handling. See section 8 for personal protective equipment.

Precautions for safe storage

Keep container cool, dry and tightly closed when not in use.

Store away from oxidisers and acidic materials and other materials listed under incompatibility (see section 10). Do not store in metal containers without a plastic lining.

Specific use

Research.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values

| Ingredient name | OES LTEL (8 hr TWA) | OES STEL (15 min) | MEL(LT) | MEL(ST) |
|--|------------------------|----------------------|---------|---------|
| Tungsten & compounds (as W) insoluble | 5mg/m ³ | 10mg/m ³ | | |

Odour Odourless

Important health, safety and environmental information

| | |
|-----------------------------|---|
| pH | N/A |
| Boiling point/boiling range | N/A |
| Melting point/melting range | 2165 ⁰ C |
| Flash point | N/A |
| Flammability (solid, gas) | Non-flammable |
| Autoignition temperature | N/A |
| Explosive properties | N/A |
| Oxidising properties | Not oxidising |
| Vapour Pressure | N/A |
| Density | 9.4g/cm ³ at 20 ⁰ C |
| Solubility Water | Insoluble |

10. STABILITY AND REACTIVITY

| | |
|----------------------------------|---|
| Stability | Stable. No decomposition if used and stored according to specification. |
| Conditions to avoid | Avoid creating dusts. |
| Materials to avoid | Avoid oxidising agents, acids, halogens and interhalogens. |
| Hazardous Decomposition Products | Toxic metal oxide smoke. |

11. TOXICOLOGICAL INFORMATION

A specific review on the clinical effects of individuals exposed to this agent has not yet been prepared. The following pertains to the general evaluation of individuals exposed to potentially

toxic chemicals.

| | |
|--|--|
| Effects from eye contact | Dusts or fume may cause eye irritation. Symptoms include redness and watering. |
| Effects from skin contact | May cause skin irritation. No allergic reaction have been reported. There is a serious danger by skin resorption. |
| Effects from inhalation | Irritating to respiratory system. Repeated exposure may cause lung damage and disorders such as bronchitis. Symptoms include difficulty in breathing, tightness in chest, cough, and dyspnoea. |
| Effects from ingestion | Ingestion may cause nausea, congestive failure, abdominal pain & vomiting. |
| (a) Acute toxicity (oral, inhalation, dermal) | not tested/no data |
| (b) Corrosivity/irritation (eye, skin, respiratory tract) Irritant for skin, eyes and mucous membranes | |
| (c) Sensitisation (skin, respiratory) No sensitising effects known | |
| (d) Repeated-dose toxicity | not tested/no data |
| (e) Mutagenicity | not tested/no data |
| (f) Carcinogenicity No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH. | |
| (g) Reproductive toxicity (fertility, developmental) | not tested/no data |

12. ECOLOGICAL INFORMATION

(1) Ecotoxicity

(a) Aquatic toxicity

- | | |
|---|--------------------|
| (i) acute and chronic for fish | not tested/no data |
| (ii) acute and chronic for daphnia | not tested/no data |
| (iii) acute and chronic for algae | not tested/no data |
| (iv) acute and chronic for other aquatic plants | not tested/no data |

| | | |
|-------------------|-----------------|--------------------|
| (b) Soil toxicity | | |
| (i) | macro organisms | not tested/no data |
| (ii) | micro organisms | not tested/no data |
| (iii) | birds | not tested/no data |
| (iv) | bees | not tested/no data |
| (v) | plants | not tested/no data |
| (vi) | fauna | not tested/no data |

Most tungsten compounds have low pressures at 25 deg C and are expected to exist solely in the particulate phase in the ambient atmosphere. Particulate- phase tungsten compounds may be removed from the air by wet and dry deposition.

Tungsten compounds are expected to exist as ions or insoluble solids in the environment and therefore volatilisation from moist soil and water surfaces is not expected to be an important fate process (SRC). Tungsten compounds are not expected to volatilise from dry soil surfaces based upon their ionic character and low vapour pressures (SRC).

(2) Mobility

see above

(3) Persistence and degradability

see above

(4) Bioaccumulation potential

No data available

(5) Other adverse effects

No other effects are known.

13. DISPOSAL CONSIDERATIONS

All waste material to be contained in a plastic sealed bin, duly marked, and disposed of as special waste through a licensed waste contractor in accordance with “The Special Waste Regulations 1996”. See sections 6 and 7.

14. TRANSPORT INFORMATION

| | | |
|-----|----------------------|-----|
| (a) | UN number | N/A |
| (b) | class | N/A |
| (c) | proper shipping name | N/A |
| (d) | packing group | N/A |

- (e) marine pollutant (if applicable) N/A
(f) other applicable information N/A

Material is not restricted for shipment

15. REGULATORY INFORMATION

EC Supply: Chip-3 regulations 2002

Xi: Irritant

Risk Phrases:

36/37/38: Irritating to eyes, respiratory system and skin.

Safety Phrases:

26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

This material is subject to the COSHH regulations 2002. See COSHH Essentials for further information.

16. OTHER INFORMATION

R Phrases Full Text:

36/37/38: Irritating to eyes, respiratory system and skin.

Abbreviations used:

| | |
|--------|---|
| CAS | Chemical Abstracts Service Registry Numbers |
| EINECS | European Inventory of Existing Commercial Chemical Substances |
| MSDS | Material Safety Data Sheet |
| HSE | Health and Safety Executive |
| TWA | Time Weighted Average |
| OES | Occupational Exposure Standards |

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This material should only be handled by qualified, trained persons, fully familiar with its dangerous properties. During use or handling, a minimum of two persons should always be available.

References:

Chemicals (Hazard Information and Packaging for Supply) Regulations 2002

Approved classification and labelling guide. Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 Guidance on Regulations L131

Approved Supply List. Information Approved for the Classification and labelling of Substances and Preparations Dangerous for Supply. Chemicals (Hazard Information and Packaging for Supply) Regulations 2002. Approved List L129

Control of Substances Hazardous to Health Regulations 2002

Health and Safety at Work Act 1974

COSHH Essentials: Easy Steps to Control Chemicals. Control of Substances Hazardous to Health Regulations

Occupational Exposure Limits 2001/2002 EH40

European Inventory of Existing Commercial Substances (EINECS) available on the European Chemicals Bureau website at www.ecb.jrc.it/existing-chemicals

First Aid at Work. The Health and Safety (First Aid) Regulations 1981. Approved Code of Practice and Guidance L74

Personal Protective Equipment (EC Directive) Regulations 1992

The Selection, Use and Maintenance of Respiratory Protective Equipment: A Practical Guide HSG53

Cost and Effectiveness of Chemical Protective Gloves for the Workplace.

Guidance for Employers and Health and Safety Specialists. HSG206

Environmental Protection Act 1990 c43

Environmental Act 1995 c25

The Special Waste Regulations 1996

The Dangerous Substances and Explosive Atmospheres Regulations 2002