

SAFETY DATA SHEET

MOLYBDENUM REAGENT

Section 1. Identification

| | | |
|-------------------------------|---|--------------------|
| GHS product identifier | : | MOLYBDENUM REAGENT |
| Product code | : | 54-A 051 |
| SDS no. | : | S-09E |
| Product type | : | Liquid. |

Relevant identified uses of the substance or mixture and uses advised against

| | | |
|---|---|--|
| Identified uses | : | Solution to distinguish AISI 316 stainless steel (use with stainless steel grade ID tester). |
| Manufacturer | : | Walter Surface Technologies Inc. 810 Day Hill Road Windsor, CT 06095 United States General Information: 1-866-592-5837 info.us@walter.com www.walter.com |
| Emergency telephone number (with hours of operation) | : | INFOTRAC® 1-800-535-5053. International call collect: 1-352-323-3500 24 hours/day, 7 days/week. |

Section 2. Hazards identification

| | | |
|---|---|--|
| OSHA/HCS status | : | This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). |
| Classification of the substance or mixture | : | SKIN CORROSION/IRRITATION - Category 1B SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1 SKIN SENSITIZATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (cardiovascular system) - Category 2 AQUATIC HAZARD (ACUTE) - Category 2 AQUATIC HAZARD (LONG-TERM) - Category 2 |

GHS label elements

| | | |
|--------------------------|---|---|
| Hazard pictograms | : | |
| Signal word | : | Danger |
| Hazard statements | : | H314 - Causes severe skin burns and eye damage. H317 - May cause an allergic skin reaction. H373 - May cause damage to organs through prolonged or repeated exposure. (cardiovascular system) H411 - Toxic to aquatic life with long lasting effects. |

Precautionary statements

Section 2. Hazards identification

| | |
|---|---|
| Prevention | : P280 - Wear protective gloves. Wear eye or face protection. Wear protective clothing. P273 - Avoid release to the environment. P260 - Do not breathe vapor. P264 - Wash hands thoroughly after handling. P272 (OSHA) - Contaminated work clothing must not be allowed out of the workplace. |
| Response | : P391 - Collect spillage. P314 - Get medical attention if you feel unwell. P304 + P340 + P310 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician. P301 + P310 + P330 + P331 - IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. P303 + P361 + P353 + P363 + P310 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. P302 + P352 + P363 - IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. P333 + P313 - If skin irritation or rash occurs: Get medical attention. P305 + P351 + P338 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician. |
| Storage | : P405 - Store locked up. |
| Disposal | : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. |
| Hazards not otherwise classified | : None known. |

Section 3. Composition/information on ingredients

| | |
|--------------------------|------------|
| Substance/mixture | : Mixture |
| Product code | : 54-A 051 |

| Ingredient name | % | CAS number |
|-----------------------|----------|------------|
| Tin dichloride | ≥5 - <10 | 7772-99-8 |
| Potassium thiocyanate | ≥1 - <5 | 333-20-0 |

The exact percentage (concentration) in the composition has been withheld as a trade secret in accordance with paragraph (i) of §1910.1200.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

| | |
|--------------------|---|
| Eye contact | : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician. |
|--------------------|---|

Section 4. First aid measures

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : No known significant effects or critical hazards.

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Section 4. First aid measures

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
sulfur oxides
halogenated compounds
metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

Spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). The spilled material may be neutralized with sodium carbonate, sodium bicarbonate or sodium hydroxide. Dispose of via a licensed waste disposal

Section 6. Accidental release measures

contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

| | |
|---|--|
| Protective measures | : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from alkalis. Empty containers retain product residue and can be hazardous. Do not reuse container. |
| Advice on general occupational hygiene | : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures. |
| Conditions for safe storage, including any incompatibilities | : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Separate from alkalis. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. |

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

| Ingredient name | Exposure limits |
|-----------------------|---|
| Tin dichloride | ACGIH TLV (United States, 3/2017). TWA: 2 mg/m ³ , (as Sn) 8 hours. NIOSH REL (United States, 10/2016). TWA: 2 mg/m ³ , (as Sn) 10 hours. OSHA PEL (United States, 6/2016). TWA: 2 mg/m ³ , (as Sn) 8 hours. OSHA PEL (United States, 6/2016). Absorbed through skin. TWA: 5 mg/m ³ , (as CN) 8 hours. |
| Potassium thiocyanate | |

Appropriate engineering controls : No personal respiratory protective equipment normally required. Avoid breathing dust/fume/gas/mist/vapors/spray. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.

Section 8. Exposure controls/personal protection

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a NIOSH/MSHA approved respirator if there is a risk of exposure at levels exceeding the exposure limits. Advice should be sought from respiratory protection specialists.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Colorless.

Odor : Odorless.

Odor threshold : Not available.

pH : 0.5 [Conc. (% w/w): 5%]

Melting point : Not available.

Boiling point : 100°C (212°F)

Flash point : Closed cup: >93.3°C (>199.9°F)

Evaporation rate : Not applicable.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : 1.08 g/ml @ 20°C (68°F)

Solubility : Soluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

Flow time (ISO 2431) : Not available.

VOC content : 0 % (w/w)

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|-------------------------|-----------|---------|-----------|----------|
| Tin dichloride | LD50 Oral | Rat | 700 mg/kg | - |
| Potassium thiocyanate | LD50 Oral | Rat | 854 mg/kg | - |

Irritation/Corrosion

There is no data available.

Sensitization

There is no data available.

Mutagenicity

There is no data available.

Carcinogenicity

There is no data available.

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

| Name | Category | Target organs |
|----------------|------------|------------------------------|
| Tin dichloride | Category 3 | Respiratory tract irritation |

Specific target organ toxicity (repeated exposure)

| Name | Category | Target organs |
|----------------|------------|-----------------------|
| Tin dichloride | Category 2 | cardiovascular system |

Aspiration hazard

There is no data available.

Information on the likely routes of exposure : Dermal contact. Eye contact. Inhalation. Ingestion.

Section 11. Toxicological information

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : No known significant effects or critical hazards.

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Long term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Potential chronic health effects

General : May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

| Route | ATE value |
|------------------------------|--------------|
| Oral | 6969.5 mg/kg |
| Dermal | 24310 mg/kg |
| Inhalation (dusts and mists) | 13.81 mg/L |

Section 12. Ecological information

Toxicity

| Product/ingredient name | Result | Species | Exposure |
|-------------------------|---|--|--|
| Tin dichloride | Acute EC50 200 µg/L Marine water Acute EC50 50.75 mg/L Fresh water | Algae - Thalassiosira pseudonana - Exponential growth phase Crustaceans - Cypris subglobosa | 72 hours |
| Potassium thiocyanate | Acute LC50 19500 µg/L Fresh water Acute LC50 11000 µg/L Fresh water Acute LC50 11000 µg/L Fresh water Chronic NOEC 1100 µg/L Fresh water | Daphnia - Daphnia magna Daphnia - Daphnia pulex Fish - Oncorhynchus mykiss Fish - Lepomis macrochirus - Juvenile (Fledgling, Hatchling, Weanling) | 48 hours 48 hours 48 hours 96 hours 124 days |

Persistence and degradability

There is no data available.

Bioaccumulative potential

| Product/ingredient name | LogP _{ow} | BCF | Potential |
|-------------------------|--------------------|-----|-----------|
| Potassium thiocyanate | -2.52 | - | low |

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods

- The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

| | DOT Classification | IMDG | IATA |
|----------------------------|--|---|--|
| UN number | UN3264 | UN3264 | UN3264 |
| UN proper shipping name | CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Tin dichloride) | CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Tin dichloride). Marine pollutant (Tin dichloride) | CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Tin dichloride) |
| Transport hazard class(es) | 8  | 8  | 8  |
| Packing group | II | II | II |
| Environmental hazards | No. | Yes. | Yes. The environmentally hazardous substance mark is not required. |

AERG : 154

Additional information

IMDG : The marine pollutant mark is not required when transported in sizes of ≤ 5 L or ≤ 5 kg.

IATA : The environmentally hazardous substance mark may appear if required by other transportation regulations.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage. Protect from freezing. Freezing will damage product and render it unusable.

Section 15. Regulatory information

U.S. Federal regulations : **United States inventory (TSCA 8b):** All components are listed or exempted.
Clean Water Act (CWA) 307: Potassium thiocyanate
Clean Water Act (CWA) 311: Hydrochloric acid

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

Section 15. Regulatory information

| Name | EHS | SARA 302 TPQ | | SARA 304 RQ | |
|-------------------|------|--------------|-----------|-------------|-----------|
| | | (lbs) | (gallons) | (lbs) | (gallons) |
| Hydrochloric acid | Yes. | 500 | - | 5000 | - |

SARA 304 RQ : 1000000 lbs / 454000 kg [111050.1 gal / 420370.4 L]

SARA 311/312

Classification : SKIN CORROSION/IRRITATION - Category 1
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
SKIN SENSITIZATION - Category 1
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (cardiovascular system) - Category 2

Composition/information on ingredients

| Name | Classification |
|-----------------------|--|
| Tin dichloride | ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION/IRRITATION - Category 1B SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1 SKIN SENSITIZATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (cardiovascular system) (oral) - Category 2 |
| Potassium thiocyanate | ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (dermal) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 |

SARA 313

There is no data available.

State regulations

Massachusetts : The following components are listed: Tin dichloride
New York : None of the components are listed.
New Jersey : The following components are listed: Tin dichloride; Potassium thiocyanate
Pennsylvania : The following components are listed: Potassium thiocyanate
California Prop. 65

No products were found.

International lists

National inventory

Australia : All components are listed or exempted.
Canada : All components are listed or exempted.
China : All components are listed or exempted.
Europe : All components are listed or exempted.
New Zealand : All components are listed or exempted.
Philippines : All components are listed or exempted.
Republic of Korea : All components are listed or exempted.
Taiwan : All components are listed or exempted.

Section 16. Other information

Procedure used to derive the classification

| Classification | Justification |
|---|-----------------------|
| SKIN CORROSION/IRRITATION - Category 1 | On basis of test data |
| SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1 | On basis of test data |
| SKIN SENSITIZATION - Category 1 | Calculation method |
| SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (cardiovascular system) - Category 2 | Calculation method |
| AQUATIC HAZARD (ACUTE) - Category 2 | Calculation method |
| AQUATIC HAZARD (LONG-TERM) - Category 2 | Calculation method |

History

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Version : 2
Prepared by : KMK Regulatory Services Inc.

Notice to reader

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