SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers
- Product name: Tungsten(IV) carbide
- Product Number: 241881
- Brand: Aldrich
- CAS-No.: 12070-12-1

1.2 Relevant identified uses of the substance or mixture and uses advised against
- Identified uses: Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet
- Company: Sigma-Aldrich Inc.
  3050 SPRUCE ST
  ST. LOUIS MO 63103
  UNITED STATES
- Telephone: +1 314 771-5765
- Fax: +1 800 325-5052

1.4 Emergency telephone
- Emergency Phone #: 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
- GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
  - Short-term (acute) aquatic hazard (Category 2), H401
- For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements
- Pictogram: none
- Signal Word: none
- Hazard statement(s): Toxic to aquatic life. H401
- Precautionary statement(s): Avoid release to the environment. P273 Dispose of contents/ container to an approved waste disposal P501
2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten carbide</td>
<td>Aquatic Acute 2; H401</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

If inhaled
After inhalation: fresh air.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.
5.2 Special hazards arising from the substance or mixture
Carbon oxides
Tungsten oxide
Combustible.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
In the event of fire, wear self-contained breathing apparatus.

5.4 Further information
none

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid inhalation of dusts. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
No special precautionary measures necessary.

6.3 Methods and materials for containment and cleaning up
Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Storage conditions
Tightly closed. Dry.

Storage class
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
Ingredients with workplace control parameters
<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten carbide</td>
<td>12070-12-1</td>
<td>TWA</td>
<td>0.005 mg/m³</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remarks</td>
<td>Respiratory sensitization</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Suspected human carcinogen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>3 mg/m³</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ST</td>
<td>10 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
</tbody>
</table>

### 8.2 Exposure controls

**Appropriate engineering controls**

Change contaminated clothing. Wash hands after working with substance.

**Personal protective equipment**

**Eye/face protection**

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

**Skin protection**

Handle with impervious gloves.

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

**Full contact**

Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: KCL 741 Dermatril®

**Splash contact**

Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: KCL 741 Dermatril®

**Respiratory protection**

required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

**Control of environmental exposure**

No special precautionary measures necessary.
SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance
   Form: powder
   Color: grayblack

b) Odor
   No data available

c) Odor Threshold
   No data available

d) pH
   No data available

e) Melting point/freezing point
   Melting point: 2,785 °C (5,045 °F) at 1,013 hPa

f) Initial boiling point and boiling range
   6,000 °C 10,832 °F at 1,013 hPa

g) Flash point
   (Not applicable)

h) Evaporation rate
   No data available

i) Flammability (solid, gas)
   The product is not flammable. - Flammability (solids)

j) Upper/lower flammability or explosive limits
   No data available

k) Vapor pressure
   No data available

l) Vapor density
   No data available

m) Density
   15.63 g/cm³ at 23 °C (73 °F)
   Relative density
   No data available

n) Water solubility
   0.00054 g/l at 21 °C (70 °F) - slightly soluble

o) Partition coefficient: n-octanol/water
   Not applicable for inorganic substances

p) Autoignition temperature
   > 140 °C (> 284 °F) at 1,013 hPa

q) Decomposition temperature
   No data available

r) Viscosity
   No data available

s) Explosive properties
   No data available

t) Oxidizing properties
   none

9.2 Other safety information
   No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
   The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.
10.2 **Chemical stability**
The product is chemically stable under standard ambient conditions (room temperature).

10.3 **Possibility of hazardous reactions**
No data available

10.4 **Conditions to avoid**
No information available

10.5 **Incompatible materials**
No data available

10.6 **Hazardous decomposition products**
In the event of fire: see section 5

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**SECTION 11: Toxicological information**

11.1 **Information on toxicological effects**

- **Acute toxicity**
  - LD50 Oral - Rat - male and female - > 2,000 mg/kg
    (OECD Test Guideline 401)
  - LC50 Inhalation - Rat - male and female - 4 h - > 5.3 mg/l - aerosol
    (OECD Test Guideline 403)
  - LD50 Dermal - Rat - male and female - > 2,000 mg/kg
    (OECD Test Guideline 402)

- **Skin corrosion/irritation**
  - Skin - Rabbit
    Result: No skin irritation - 4 h
    (OECD Test Guideline 404)

- **Serious eye damage/eye irritation**
  - Eyes - Rabbit
    Result: No eye irritation
    (OECD Test Guideline 405)

- **Respiratory or skin sensitization**
  - Maximization Test - Guinea pig
    Result: negative
    (OECD Test Guideline 406)

- **Germ cell mutagenicity**
  - Test Type: Mutagenicity (mammal cell test): chromosome aberration.
    Test system: Human lymphocytes
    Metabolic activation: with and without metabolic activation
    Method: OECD Test Guideline 473
    Result: negative
  - Test Type: Micronucleus test
    Test system: Human lymphocytes
    Metabolic activation: without metabolic activation
    Method: OECD Test Guideline 487
    Result: negative
  - Test Type: Mutagenicity (mammal cell test): chromosome aberration.
    Test system: Chinese hamster lung cells
    Metabolic activation: with and without metabolic activation
    Method: OECD Test Guideline 473
Result: negative
Test Type: Ames test
Test system: Escherichia coli/Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: Micronucleus test
Species: Mouse
Cell type: Red blood cells (erythrocytes)
Application Route: Oral
Method: OECD Test Guideline 474
Result: negative

**Carcinogenicity**

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

**Reproductive toxicity**
No data available

**Specific target organ toxicity - single exposure**
No data available

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
No data available

### 11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - 90 Days - NOAEL (No observed adverse effect level) - 75 mg/kg - LOAEL (Lowest observed adverse effect level) - 125 mg/kg

Repeated dose toxicity - Mouse - male and female - inhalation (dust/mist/fume) - 90 Days - NOAEL (No observed adverse effect level) - \( \geq 15 \) mg/kg

RTECS: YO7250000
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

### SECTION 12: Ecological information

#### 12.1 Toxicity

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>static test LC50 - Danio rerio (zebra fish) - ( \geq 1,000 ) mg/l - 96 h (OECD Test Guideline 203)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to daphnia</td>
<td>static test EC50 - Daphnia magna (Water flea) - ( \geq 1,000 ) mg/l - 48 h</td>
</tr>
</tbody>
</table>
and other aquatic invertebrates (OECD Test Guideline 202)

Toxicity to algae static test ErC50 - Desmodesmus subspicatus (green algae) - > 1 mg/l - 72 h (Regulation (EC) No. 440/2008, Annex, C.3)

Toxicity to bacteria static test EC50 - activated sludge - > 1,000 mg/l - 3 h (OECD Test Guideline 209)

12.2 Persistence and degradability
The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential
Bioaccumulation Poecilia reticulata (guppy) - 24 hrs at 23.5 °C - 0.0075 mg/l (Tungsten carbide)

Bioconcentration factor (BCF): 1.23 (US-EPA)

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

Further information
Not classified as dangerous in the meaning of transport regulations.
SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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