

# TIN (IV) OXIDE

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## 1. Product Identification

**Synonyms:** Tin oxide; Tin dioxide; Tin (IV) oxide; cassiterite; tin peroxide; stannic acid; stannic anhydride; Stannic dioxide; White tin oxide

**CAS No.:** 18282-10-5 or 1332-29-2

**Molecular Weight:** 150.7

**Chemical Formula:** SnO<sub>2</sub>

**Product Codes:** CHEM-601 and others

## 2. Composition/Information on Ingredients

| Ingredient    | CAS No                               | Percent | Hazardous |
|---------------|--------------------------------------|---------|-----------|
| Stannic oxide | 18282-10-5 or 1332-29-2 or 1317-45-9 | 100     | Yes       |

## 3. Hazards Identification

### Toxicological Data on Ingredients:

Stannic oxide: ORAL (LD50): Acute: >20000 mg/kg [Rat]. >20000 mg/kg [Mouse].

### SAF-T-DATA<sup>(tm)</sup> Ratings

Health Rating: 2 - Moderate

Flammability Rating: 0 - None

Reactivity Rating: 0 - None

Contact Rating: 1 - Slight

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: Green (General Storage)

### Potential Acute Health Effects:

Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion.

### Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available.

TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to mucous membranes. The substance may be toxic to lungs, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

## 4. First Aid Measures

### Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

**Skin Contact:** Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

**Serious Skin Contact:** Not available.

### Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:** Not available.

### Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

**Serious Ingestion:** Not available.

## 5. Fire Fighting Measures

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

Stannic oxide is reduced by potassium or sodium at gentle heat and the reaction is accompanied by incandescence. On heating stannic oxide at 300°C, oxidation proceeds incandescently. Stannic oxide ignites in nitrous oxide at 400°C and incandesces when heated in sulfur dioxide.

**Special Remarks on Fire Hazards:**

Stannic oxide is reduced by potassium or sodium at gentle heat and the reaction is accompanied by incandescence. On heating stannic oxide at 300°C, oxidation proceeds incandescently. Stannic oxide ignites in nitrous oxide at 400°C and incandesces when heated in sulfur dioxide.

**Special Remarks on Explosion Hazards:** Not available.

## 6. Accidental Release Measures

### Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

### Large Spill:

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## 7. Handling and Storage

### Precautions:

Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

## 8. Exposure Controls/Personal Protection

Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

### Section 8: Exposure Controls/Personal Protection

#### Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection:** Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

#### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

#### Exposure Limits:

TWA: 2 (mg(Sn)/m) from ACGIH (TLV) [United States] Consult local authorities for acceptable exposure limits.

## 9. Physical and Chemical Properties

**Physical state and appearance:** Solid. (Powdered solid.)

**Odor:** Odorless.

**Taste:** Not available.

**Color:** White. Grey.

**pH (1% soln/water):** Not applicable.

**Boiling Point:** Not available.

#### Melting Point:

1630°C (2966°F)(Handbook of Chemistry and Physics, 69th. ed.) 1127°C (Hawley's Condensed Chemical Dictionary) Sublimes at 1800 - 1900°C.

**Critical Temperature:** Not available.

**Specific Gravity:** 6.95 at room temperature (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** Not available.

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:** Insoluble in cold water, hot water. Soluble in concentrated sulfuric acid, hydrochloric acid. Insoluble in cold alcohol, Aqua Regia, cold acids. Slowly soluble in hot concentrated potassium or sodium hydroxide.

## 10. Stability and Reactivity

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Incompatible with chlorine trifluoride. Chloride Trifluoride produces violent reaction without flame in presence of stannic oxide. Incompatible with potassium or sodium. Stannic oxide is reduced by potassium or sodium at gentle heat and the reaction is accompanied by incandescence. On heating stannic oxide at 300 deg. C, oxidation proceeds incandescently. Stannic oxide ignites in nitrous oxide at 400 deg. C and incandesces when heated in sulfur dioxide.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## 11. Toxicological Information

**Routes of Entry:** Inhalation. Ingestion.

**Toxicity to Animals:** Acute oral toxicity (LD<sub>50</sub>): >20000 mg/kg [Mouse].

**Chronic Effects on Humans:**

Causes damage to the following organs: mucous membranes. May cause damage to the following organs: lungs, upper respiratory tract.

**Other Toxic Effects on Humans:**

Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant), of ingestion.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Skin: May cause skin irritation. Eyes: May cause eye irritation.

Inhalation: Although poorly absorbed when inhaled, Inhalation of dust/fumes may cause nausea, vomiting diarrhea, respiratory tract irritation, stannosis or benign pneumoconiosis, dyspnea (breathing difficulty, decreased pulmonary function. Inhalation of fumes may also cause metal fume fever, which is characterized by flu-like symptoms such as metallic taste, fever, chills, cough, weakness, chest pain, muscle pain, and increased white blood cell count. Ingestion: There is as low toxicological risk generally associated with inorganic tin compound ingestion due largely to the low degree of absorption, low tissue retention, and rapid turnover of the element. Ingestion of large amounts may cause gastrointestinal tract irritation, nausea, cramps, vomiting, diarrhea. It may interfere with various enzyme systems. Inorganic tin salts may affect the central nervous system, heart, liver.

**Chronic Potential Health Effects:** Inhalation: Beign pneumoconiosis (stannosis), dyspnea, or decreased pulmonary may occur following chronic inhalation exposure.

## 12. Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The product itself and its products of degradation are not toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

## 15. Regulatory Information

**Federal and State Regulations:**

Massachusetts RTK: for CAS No. 1332-29-2; Massachusetts RTK lists it as Tin Oxide. CAS No. 18282-10-5 is not TSCA listed; CAS No. 1332-29-2 is TSCA listed

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances. (EINECS no. 242-159-9 for CAS No. 1332 -29-2); EINECS listed as Tin Dioxide)

**Other Classifications:**

**WHMIS (Canada):** Not controlled under WHMIS (Canada).

**DSCL (EEC):**

This product is not classified according to the EU regulations. Not applicable.

**Protective Equipment:**

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

## 16. Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**National Fire Protection Association (U.S.A.):**

**Health: 2; Flammability: 0; Reactivity: 0**

**Specific hazard:**

**Label Hazard Warning:**

CAUTION! MAY IRRITATE RESPIRATORY TRACT.

**Label Precautions:**

Avoid breathing dust.

Keep container closed.

Use with adequate ventilation.

**Label First Aid:**

If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.

**Product Use:**

Laboratory Reagent and Consumer Hobby.

**Revision Information:**

None

**Disclaimer:**

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