A. PRODUCT/COMPANY IDENTIFICATION

TRADE NAME (COMMON NAME OR SYNONYM)
Zinc Oxide (Freschi Process)

CHEMICAL NAME
Zinc Oxide

FORMULA
ZnO

MOLARITY
81.38

ASARCO PRODUCT CODE#
AZO, AZODOX, AZOFLO

B. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>MATERIAL OR COMPONENT</th>
<th>CAS. #</th>
<th>WT. %</th>
<th>PERMISSIBLE AIR CONC. (mg/cu.m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc oxide</td>
<td>1314-13-2</td>
<td>99.7-100</td>
<td>OSHA: 5.0 Resp. Dust</td>
</tr>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>&lt; 0.003</td>
<td>ACGIH: 10.0 Total Dust</td>
</tr>
<tr>
<td>Cadmium</td>
<td>7440-43-9</td>
<td>&lt; 0.002</td>
<td></td>
</tr>
</tbody>
</table>

C. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY
\( \text{INGESTION} \times \text{INHALATION} \times \text{SKIN} \)

CARCINOGENICITY
Not listed as a carcinogen by IARC, NTP, OSHA.

ACUTE OVEREXPOSURE (SYMPTOMS AND EFFECTS)
1. Metal fume fever with symptoms of fever, chills, metallic taste, chest tightness or nausea may result from inhalation of zinc oxide fume or dust.
2. Zinc oxide is relatively non-toxic by mouth, but may cause fever, nausea, stomach cramps or diarrhea in large doses.
3. Dermatitis (papulopustular eczema) with intense itching may result from excessive skin contact.

CHRONIC OVEREXPOSURE (SYMPTOMS AND EFFECTS)
None reported.

MEDICAL CONDITIONS POSSIBLY AGGRAVATED
None reported.

D. FIRST AID MEASURES

Inhalation: Remove from exposure; place individual under care of a physician.
Ingestion: Induce vomiting in conscious individual and call a physician.
Skin or Eyes: Flush with plenty of water. If symptoms develop, consult a physician.

E. FIRE FIGHTING MEASURES

FLASH POINT: Not Applicable
AUTO IGNITION TEMPERATURE: Not Applicable
FLAMMABLE LIMITS IN AIR (% BY VOL): Not Applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS
FIRE EXTINGUISHING AGENTS RECOMMENDED: No specific agents recommended
FIRE EXTINGUISHING AGENTS TO AVOID: No specific agents

SPECIAL FIRE FIGHTING PRECAUTIONS
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.
**G. HANDLING AND STORAGE**

**NORMAL HANDLING**
Use of approved respirators is required for applications where adequate ventilation cannot be provided. Activities which generate dust or fume should be avoided. When melted, the temperature should be kept as low as possible.

**STORAGE**
General storage procedures acceptable.

**H. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**ENGINEERING CONTROLS**
Local exhaust ventilation is recommended for dust and/or fume generating operations where airborne exposures may exceed permissible air concentrations.

**PERSONAL HYGIENE**
Avoid inhalation or ingestion. Practice good housekeeping and personal hygiene procedures. A shower is recommended if significant dust exposure occurs.

**RESPIRATORY PROTECTION**
Where airborne exposures may exceed OSHA/ACGIH permissible air concentrations, the minimum respiratory protection recommended is a negative pressure air purifying respirator with cartridges that are NIOSH/MSHA approved against dust, fumes and mists having a TWA not less than 0.05 mg/m³.

**SPECIAL PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS**
NFPA HAZARDS 1H-OF-0R-PPE(E)
NFPA Classification: 1H, 0F, 0R

**LABEL SIGNAL WORD:** CAUTION

**EYES AND FACE**
Safety glasses recommended where the possibility of getting dust particles in eyes exists.

**OTHER CLOTHING AND EQUIPMENT**
Protective clothing is recommended for jobs with heavy dust exposure to prevent skin irritation. Contaminated clothing should be removed before leaving plant premises.

**I. PHYSICAL/CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>MATERIAL IS (AT NORMAL CONDITIONS)</th>
<th>APPEARANCE AND ODOR</th>
<th>MELTING POINT (DEGREES C)</th>
<th>BOILING POINT (DEGREES C)</th>
<th>SPECIFIC GRAVITY (H2O = 1)</th>
<th>VAPOR DENSITY (AIR = 1)</th>
<th>PH</th>
<th>VAPOR PRESSURE (mm Hg)</th>
<th>EVAPORATION RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid</td>
<td>White powder, odorless</td>
<td>Sublimes at 1975</td>
<td>Not Available</td>
<td>5.6</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER (% BY WT.)</td>
<td>Insoluble</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**J. STABILITY AND REACTIVITY**

**STABILITY**
Stable

**CONDITIONS TO AVOID**
Not Applicable

**INCOMPATIBILITY (MATERIALS TO AVOID)**
Zinc oxide and magnesium can react explosively when heated. Zinc oxide and chlorinated rubber were mixed and exploded in one instance.

**HAZARDOUS DECOMPOSITION PRODUCTS**
None

**HAZARDOUS POLYMERIZATION**
Will not occur

**CONDITIONS TO AVOID**
Not Applicable

**K. TOXICOLOGICAL INFORMATION**

**LD50 (SPECIES, ROUTE)**
Not available.

**LC50 (SPECIES)**
Not available.

**MUTAGENICITY**
Not available.

**L. ECOLOGICAL**

**COTOXICITY**
Not available.

**ENVIRONMENTAL FATE**
Not available.
M. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE, AND LOCAL DISPOSAL OR DISCHARGE LAWS)
If hazardous under 40 CFR 261, Subparts B and C, material must be treated or disposed in a facility meeting the requirements of 40 CFR 264 or 265. If non-hazardous, material should be disposed in a facility meeting the requirements of 40 CFR 257.

RCRA STATUS OF UNUSED MATERIAL
If discarded in unaltered form, material should be tested to determine if it must be classified as a hazardous waste for disposal purposes. Under specific circumstances, application can be made to the EPA Administrator to have a particular waste designated non-hazardous.

N. TRANSPORT

DOT REGULATION AND ID (OR PIN) NUMBER
This material is not regulated by the DOT.

O. REGULATORY INFORMATION

WHMIS CLASSIFICATION, SARA REGULATION AND OTHER INFORMATION
WHMIS does not classify this material
TSCA Status: On TSCA Inventory
Regulated under SARA Title III:
Sec. 302: None
Sec. 311/312: Immediate
Sec. 313 Chemicals: Zinc compounds
CERCLA Reportable Quantity: None

WARNING: The State of California has listed lead as a chemical which can cause birth defects of other reproductive harm and has listed cadmium as a chemical known to cause cancer.

REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES
OSHA regulations for airborne contaminants 29 CFR 1910.1000 and 1018: ACGIH Threshold Limit Values for Chemical Substances

HAZARD INFORMATION REFERENCES
Documentation of the Threshold Limit Values, 6th Ed., ACGIH
Handbook of Toxic and Hazardous Chemicals; Sittig, Marshall; 1981
OMES Plus Database; Micromedex, Inc., Vol. 17, 1993

GENERAL

I. ADDITIONAL INFORMATION

FORMATION (HAZARDS, FIRST AID, ETC.) IS ABBREVIATED. MORE INFORMATION IS CONTAINED IN REFERENCES FOUND IN SECTION P.

Additional information Contact: ASARCO Incorporated
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