MATERIAL SAFETY DATA SHEET

This form may be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200.
IDENTITY (As Used on Label and List): Zinc Arsenide Zn3As2, powder and pieces
Product Code: Z-MSDS0016 Reference #: 12006-40-5

SECTION I - Product Identification
Zinc Arsenide Zn3As2, powder and pieces

MANUFACTURER NAME AND ADDRESS:
CERAC, inc.
1316 W. St. Paul Avenue
Milwaukee, WI. 53233

TELEPHONE NUMBERS:
CHEMTREC (800)424-9300 Date Entered: 05/23/1990
CERAC, inc. (414)289-9800 Revision: 01/10/2002
Local Poison/Emrgncy ( ) - 911 Printed: 03/22/2002

SYNONYMS
Zinc arsenide

CHEMICAL FAMILY: Metal arsenide

DOT HAZARD LABEL: No data.

MOLECULAR FORMULA: Zn3As2

MOLECULAR WEIGHT: 345.98

SECTION II - Hazardous Ingredients/Identity Information
Zinc Arsenide Zn3As2, powder and pieces

HAZARDOUS COMPONENTS (SPECIFIC CHEMICAL IDENTITY/COMMON NAME)

<table>
<thead>
<tr>
<th>NAME:</th>
<th>Zinc arsenide</th>
<th>CAS #:</th>
<th>12006-40-5</th>
<th>PERCENTAGE:</th>
<th>0.0 -100.0 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSHA PEL:</td>
<td>0.01 mg/m3</td>
<td>ACGIH TLV:</td>
<td>0.01 mg/m3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEC.302 (EHS):</td>
<td>No</td>
<td>SEC.304 RQ:</td>
<td>Yes 1 LB**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEC.313:</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION III - Physical/Chemical Characteristics
Zinc Arsenide Zn3As2, powder and pieces
**PHYSICAL STATES:**  
[ ] Gas  
[ ] Liquid  
[ X ] Solid  

**BOILING POINT:**  
NE or NA  

**MELTING POINT:**  
1015.00 C  

**SPECIFIC GRAVITY (WATER = 1):**  
5.53  

**DENSITY:**  
No data.  

**VAPOR PRESSURE (VS. AIR OR MM HG):**  
No data.  

**VAPOR DENSITY (VS. AIR = 1):**  
No data.  

**EVAPORATION RATE (VS BUTYL ACETATE=1):**  
No data.  

**SOLUBILITY IN WATER:**  
insoluble  

**PERCENT VOLATILE:**  
NE or NA  

**PH:**  
No data.  

**APPEARANCE AND ODOR**  
Silvery to black powder and pieces, garlic-like odor

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**SECTION IV - Fire and Explosion Hazard Data**  
Zinc Arsenide Zn3As2, powder and pieces

**FLASH PT:** NE or NA  
**METHOD USED:** No data.  

**EXPLOSIVE LIMITS:**  
LEL: NA  
UEL: NA

**EXTINGUISHING MEDIA**  
USE: Not applicable. Use suitable extinguishing media for surrounding material and type of fire.

**SPECIAL FIRE FIGHTING PROCEDURES**  
Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

**UNUSUAL FIRE AND EXPLOSION HAZARDS**  
When heated to decomposition, zinc arsenide may emit toxic fumes of arsenic, oxides arsenic and oxides of zinc.

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**SECTION V - Reactivity Data**  
Zinc Arsenide Zn3As2, powder and pieces

**STABILITY:** Unstable  
[ ] Stable  
[ X ]  

**CONDITIONS TO AVOID - INSTABILITY**  
None

**INCOMPATIBILITY - MATERIALS TO AVOID**  
Acids, oxidizers, Rb2C2, halogens, interhalogens, NCl3 and possibly halocarbons.

**HAZARDOUS DECOMPOSITION OR BYPRODUCTS**  
Arsenic and oxides of arsenic and zinc.

**HAZARDOUS POLYMERIZATION:** Will occur  
[ ] Will not occur  
[ X ]

**CONDITIONS TO AVOID - HAZARDOUS POLYMERIZATION**
SECTION VI - Health Hazard Data
Zinc Arsenide Zn3As2, powder and pieces

ROUTE(S) OF ENTRY: Inhalation? Yes , Skin? No , Eyes? No , Ingestion? Yes , Other: N

HEALTH HAZARDS (ACUTE AND CHRONIC)
Zinc has variable toxicity, but generally of low toxicity. Zinc is not inherently a toxic element. However, when heated, it evolves a fume of zinc oxide which, when inhaled fresh, can cause a disease know as "brass founders,""ague," or "brass chills." There is no cumulative effect from the inhalation of zinc fumes. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

Inorganic arsenic compounds are confirmed human carcinogens producing tumors of the mouth, esophagus, larynx, bladder, and para nasal sinus. A recognized carcinogen of the skin, lungs and liver. Poisoning from arsenic compounds may be acute or chronic. Acute poisoning usuusally results from swallowing arsenic compounds; chronic poisoning from either swallowing or inhaling. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

INHALATION:
Acute: DANGER-POISON. May cause irritation to the respiratory system.
Chronic: DANGER-POISON. May cause chronic arsenic poisoning, ulceration of the nasal septum, liver damage and cancer/disease of the blood, kidneys and nervous system.

INGESTION:
Acute: DANGER-POISON. May cause systemic gastrointestinal and skin effects and acute arsenic poisoning.
Chronic: DANGER-POISON. May cause chronic arsenic poisoning, gastrointestinal disturbances, liver damage and cancer/disease of the blood, kidneys and nervous system.

SKIN:
Acute: May cause irritation and skin abnormalities.
Chronic: May cause irritation, occasional ulceration, spotty pigmentation, dermatitis, skin cancer and keratoses (especially on soles and palms).

EYE:
Acute: May cause irritation.
Chronic: No chronic health effects recorded.

TARGET ORGANS: May affect the liver, kidneys, skin, lungs and lymphatic system.

CARCINOGENICITY: NTP? Yes , IARC Monographs? Yes , OSHA Regulated? Yes
CARCINOGENICITY/OTHER INFORMATION
No data available.
RECOMMENDED EXPOSURE LIMITS: See "Section II" LD 50/LC 50: No toxicity data recorded

SIGNS AND SYMPTOMS OF EXPOSURE
INHALATION: May cause laryngitis, bronchitis, and huskiness of the voice. Chronic arsenic poisoning may
cause: disturbances of the digestive system such as loss of appetite, cramps, nausea, constipation or diarrhea.

INGESTION: May cause gastrointestinal disturbances, irritation of the nose and conjunctiva, skin eruptions and inflammation. Acute arsenic poisoning may cause: irritation of the stomach and intestines with nausea, vomitus and stools are bloody, collapse and shock with weak rapid pulse and cold sweats. May cause chronic arsenic poisoning, see inhalation symptoms.

SKIN: May cause redness, itching, ulcerations, and pigmentation changes.

EYE: May cause redness, itching and burning.

**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE**
Pre-existing respiratory and skin disorders

**EMERGENCY AND FIRST AID PROCEDURES**

INHALATION: Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention immediately.

INGESTION: If conscious, give 1-2 glasses of milk or water and induce vomiting; seek medical attention immediately.

SKIN: Remove contaminated clothing from affected area; brush material off skin; wash affected area with mild soap and water; seek medical attention immediately.

EYE: Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention immediately.

**NOTE TO PHYSICIAN**
No data available.

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**SECTION VII - Precautions for Safe Handling and Use**
*Zinc Arsenide Zn3As2, powder and pieces*

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**
Wear appropriate respiratory and protective equipment specified in section VIII-control measures. Isolate spill area and provide proper ventilation. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

**WASTE DISPOSAL METHOD**
Dispose of in accordance with local, state and federal regulations.

**HAZARD LABEL INFORMATION:**
Store in cool, dry area Store in tightly sealed container
Wash thoroughly after handling Use with wet methods if possible

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING**
None
PRECAUTIONS TO BE TAKEN IN STORING
None

OTHER PRECAUTIONS
Minimum requirements for warning labels according to OSHA 29 CFR 1910.1018 (p)(3) is as follows: Danger; Contains inorganic arsenic; Cancer hazard; Harmful if inhaled or swallowed; Use only with adequate ventilation or respiratory protection.

SECTION VIII - Control Measures
Zinc Arsenide Zn3As2, powder and pieces

PROTECTIVE EQUIPMENT SUMMARY - HAZARD LABEL INFORMATION
NIOSH approved respirator  Face shield  Full protective clothing or suit
Eye wash station in work area  Impervious gloves  Safety goggles

RESPIRATORY EQUIPMENT (SPECIFY TYPE)
Select according to OSHA 29 CFR 1910.1018(h)(2)(i) Table 1 and 2

VENTILATION
Local Exhaust: Local exhaust ventilation may be necessary to control any air contaminants to within their PELs or TLVs during the use of this product.
Special: Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Mechanical (Gen): Not recommended
Other: None

EYE PROTECTION
Safety goggles or face shield

PROTECTIVE GLOVES
Rubber

OTHER PROTECTIVE CLOTHING
Protective gear suitable to prevent contamination

WORK/HYGIENIC/MAINTENANCE PRACTICES
Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air.

SECTION IX - Additional Comments
Zinc Arsenide Zn3As2, powder and pieces
The above information is accurate to the best of our knowledge. However, since data, safety standards, and government regulations are subject to change, and the conditions of handling and use or misuse are beyond our control, CERAC MAKES NO WARRANTY, EITHER EXPRESSED NOR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN, AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. Users should satisfy themselves that they have all current data relevant to their particular use.

Abbreviations used: NA=Not Applicable NE: Not Established