MATERIAL SAFETY DATA SHEET
OSHA HAZARD COMMUNICATION RULE

DATE OF LAST REVISION: 05-22-96

CHEMICAL IDENTITY

| LABEL IDENTITY | BISMUTH |
| FORMULA | Bi |
| CHEMICAL FAMILY | ELEMENT |
| HAZARDOUS INGREDIENTS | NONE LISTED |

PHYSICAL AND CHEMICAL PROPERTIES

| COLOR, FORM AND ODOR | Silvery white or reddish metal, soft and brittle, Odorless |
| BOILING POINT | 1420-1560 |
| VAPOR DENSITY | NA |
| VAPOR PRESSURE | 1mm @ 1021°C |
| % VOLATILE BY VOLUME (%) | NA |
| SPECIFIC GRAVITY | 9.80 |
| EVAPORATION RATE (H2O=1) | NA |
| SOLUBILITY IN WATER | Insoluble |
| MELTING POINT | 271.3 |

FIRE AND EXPLOSION HAZARD DATA

| FLASH POINT | NA |
| FLAMMABLE LIMITS | Non-flammable |
| EXTINGUISHING MEDIA | Dry sand or powder for metal powders. |
| SPECIAL FIRE FIGHTING PROCEDURES | Wear a self-contained breathing apparatus |
| UNUSUAL FIRE & EXPLOSION HAZARDS | Bismuth powder has a moderate fire hazard when exposed to flame and by chemical reaction with oxidizing agents. |
BISMUTH
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HEALTH HAZARD INFORMATION

TOXICITY DATA
Ldlo=221mg/kg (unknown route - human)

ROUTES OF ENTRY
INHALATION: ND
SKIN: ND
INGESTION: Yes

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: No Data

EFFECTS OF OVEREXPOSURE (acute and chronic):
Bismuth and its salts can cause mild kidney damage. However, bismuth is considered the least toxic of the heavy metals

CARCINOGENICITY: None  NTP: No  IARC MONOGRAPHS: NO  OSHA REGULATE: NO

EMERGENCY FIRST AID PROCEDURES:
INGESTION: Symptoms are nausea, abdominal pain. Give water to drink. Seek medical attention.
INHALATION: Symptoms are irritation of respiratory tract. Give fresh air and rest.
SKIN CONTACT: Symptoms are mild irritation. Wash off with water.
EYE CONTACT: Symptoms are redness, pain. Irrigate with water for at least 20 minutes.

REACTIVITY DATA

STABILITY
Stable

CONDITIONS TO AVOID
High acidity

INCOMPATIBILITY (MATERIALS TO AVOID)
Aluminum and air, acids, halogens and perchloric acid.

HAZARDOUS DECOMPOSITION PRODUCTS
Bismuth can react with acid or acid fumes to emit toxic fumes.

HAZARDOUS POLYMERIZATION
Will Not Occur

CONDITIONS TO AVOID
None known
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SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Wear respiratory protection if dusty. Sweep up and transfer to a sealed container.

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

SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION

Wear high efficiency respirator for any dust or fume producing operations.

LOCAL EXHAUST

Fume hood if dust or fumes are produced

MECHANICAL (general)

NA

SPECIAL

NA

OTHER

NA

PROTECTIVE GLOVES

Rubber Gloves

EYE PROTECTION

Safety goggles

OTHER PROTECTIVE EQUIPMENT

As needed to prevent contact

SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE:
Store in cool, dry area avoiding contact with fumes or hot surfaces.

TRANSPORTATION REQUIREMENTS

DOT CLASS: Not Classified
UN NUMBER: NC
IMCO CLASS: NC
OTHER: ---

PRECAUTIONARY LABELING

NONE

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NA = NOT APPLICABLE
ND = NO DATA
NC = NOT CLASSIFIED