



MATERIAL SAFETY DATA SHEET
COMPLIES WITH 29 CFR 1910.1200.
OSHA HAZARD COMMUNICATION RULE

DATE OF LAST REVISION: 03-18-10

CHEMICAL IDENTITY

LABEL IDENTITY	GERMANIUM
CHEMICAL NAME/SYNONYMS	GERMANIUM
FORMULA	Ge
CHEMICAL FAMILY	METAL
CAS REGISTRY NUMBER	7440-56-4, LISTED IN THE TSCA INVENTORY
HAZARDOUS INGREDIENTS	GERMANIUM
%: 100	TLV: 10mg/m3 OSHA/PEL: 15mg/m3 (as nuisance particles)

PHYSICAL AND CHEMICAL PROPERTIES

COLOR, FORM ODOR	Gray-white metalloid, crystalline and brittle stable at room temperature, odorless
BOILING POINT	2830
DENSITY (gm/cc)	5.323 at 25°C
VAPOR PRESSURE @ 20°	NA
% VOLATILE BY VOLUME (%)	NA
REACTION WITH WATER	ND
EVAPORATION RATE (H2O=1)	ND
SOLUBILITY IN WATER	Insoluble
MELTING POINT	925-975 (937.12 best value)

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	NA
AUTOIGNITION TEMPERATURE (° C)	NA
FLAMMABILITY	Hazard as fine dust or powder
EXTINGUISHING MEDIA	Use dry chemical, CO₂.
SPECIAL FIRE FIGHTING PROCEDURES	Wear self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes.
UNUSUAL FIRE & EXPLOSION HAZARDS	Material may emit toxic fumes if involved in a fire. Moderate fire and explosion hazard as a fine powder/dust when exposed to air or flame When material is finely divided, it burns in C12 or Br2. Relatively stable, unaffected by air, becomes oxidized above 600°C



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HEALTH HAZARD INFORMATION

TOXICITY DATA ipr-rat LD50: **750mg/kg** scu-rbt LD50: **845mg/kg**
 ipr-pgp LDLO: **400mg/kg**

HMIS RATING:

HEALTH: **2** FLAMMABILITY: **2** REACTIVITY: **1** PERSONAL PROTECTION: **F**

ROUTES OF ENTRY

INHALATION: **Yes**
SKIN: **Yes**
INGESTION: **Yes**

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: **Respiratory Disorders**
EFFECTS OF OVEREXPOSURE (acute and chronic):

INHALATION: **a respiratory irritant, coughing, sneezing, difficulty breathing and pulmonary edema possible. May irritate mucous membranes of the nose and throat.**

DERMAL: **irritation, inflammation, redness possible. May cause dermatitis.**

EYE: **irritation, inflammation, watering and redness possible.**

OTHER: ***SEE ATTACHED SHEET***

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

EMERGENCY FIRST AID PROCEDURES:

INGESTION: **Administer 1-2 glasses of milk or water and induce vomiting**

INHALATION: **Remove to fresh air, give oxygen if breathing is difficult**

SKIN CONTACT: **Wash affected area with soap and water**

EYE CONTACT: **Flush eyes for at least 15 minutes with lukewarm water**

Seek Medical Attention Under all Circumstances Mentioned Above

REACTIVITY DATA

STABILITY

Stable

CONDITIONS CONTRIBUTING TO UNSTABILITY

Heat

INCOMPATIBILITY (MATERIALS TO AVOID)

Aqua regia, concentrated HNO3 or H2SO4, fused alkalis, nitrates or carbonates, halogens, oxidants

HAZARDOUS DECOMPOSITION PRODUCTS

GeO2, GeO

HAZARDOUS POLYMERIZATION

Will Not Occur

CONDITIONS TO AVOID

Heat, incompatible materials



GERMANIUM MATERIAL SAFETY DATA SHEET

SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Wear self-contained breathing apparatus and full protective clothing. Isolate area where

spill occurred and ensure proper ventilation, vacuum spill using high efficiency unit and place in container for proper disposal. Take care not to raise dust.

WASTE DISPOSAL METHOD:

Consult federal, state and local regulations for proper disposal.

SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION	NIOSH approved dust-mist-fume cartridge respirator
LOCAL EXHAUST	Maintain below TLV
MECHANICAL (general)	Recommended
SPECIAL	Handle in a dry, inert atmosphere
OTHER	NA
PROTECTIVE GLOVES	Neoprene
EYE PROTECTION	Safety glasses
OTHER PROTECTIVE EQUIPMENT	Wear protective clothing to prevent contamination of skin and clothes

SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE:

Store in tightly closed containers in a cool, dry place. Wash hands and face thoroughly after handling and before meals.

TRANSPORTATION REQUIREMENTS	DOT CLASS:	Not Classified
	UN NUMBER:	NC
	IMCO CLASS:	NC
	OTHER:	

PRECAUTIONARY LABELING **NONE**

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, **ANGSTROM SCIENCES** MAKE NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR THE RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

NA= NOT APPLICABLE

ND= NO DATA FOUND



ATTACHED SHEET FOR GERMANIUM

OTHER: Germanium compounds are considered to be of a low order of toxicity, but rare instances of poisoning have been reported in the literature. Interest is high in this material because of its close chemical relationship to arsenic. It has been found that the dioxide stimulates the generation of red blood cells, but it is believed to be relatively non-toxic. When germanium is given in sub-lethal amounts, it causes a pronounced tolerance to be exhibited. Germanium compounds are considered much less toxic than the corresponding lead and tin compounds.