

LTS RESEARCH LABORATORIES, INC.
MATERIAL SAFETY DATA SHEET
SELENIUM GERMANIUM

GENERAL

MANUFACTURER/SUPPLIER: LTS RESEARCH LABORATORIES, INC.

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COMPANY'S CITY: ORANGEBURG
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DATE MSDS PREPARED: 08/23/11

1. PRODUCT IDENTIFICATION

PRODUCT NAME: SELENIUM GERMANIUM
CHEMICAL FORMULA: SeGe
CAS NO: 7782-49-2/ 7440-56-4

2. PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT (C 760 MMHG): N/A
MELTING POINT (C): N/A
SPECIFIC GRAVITY (H2O = 1): N/A
VAPOR PRESSURE (mm Hg): N/A
PERCENT VOLATILE BY VOL (%): N/A
VAPOR DENSITY (AIR = 1): N/A
EVAPORATION RATE (BUAC = 1): N/A
SOLUBILITY IN WATER (%): INSOLUBLE
APPEARANCE: GRAYISH POWDER AND PIECES, SPUTTERING TARGET,
ODORLESS

3. HAZARDS IDENTIFICATION

HAZARDOUS COMPONENT 0-100%
SELENIUM: OSHA/PEL: 0.2 MG/M³
ACGIH/TLV: 2 MG/M³
GERMANIUM: OSHA/PEL: 15 MG/M³ (DUST), 5 MG/M³ (RESP)
ACGIH/TLV 10MG/M³ TOTAL DUST

HAZARD DESCRIPTION: T TOXIC
RISK PHRASES: R 23/25 TOXIC BY INHALATION AND IF SWALLOWED
R 33 DANGER OF CUMULATIVE EFFECTS
R 53 MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE
AQUATIC ENVIRONMENT

HMIS RATINGS:
HEALTH: 1
FLAMMABILITY: 1
REACTIVITY: 0

4. HEALTH HAZARD INFORMATION

SELENIUM:
EFFECTS OF EXPOSURE: TO THE BEST OF OUR KNOWLEDGE THE CHEMICAL,
PHYSICAL AND TOXICOLOGICAL PROPERTIES OF
SELENIUM HAVE NOT BEEN THOROUGHLY
INVESTIGATED AND RECORDED.
SELENIUM IN SMALL AMOUNTS IS ESSENTIAL FOR
NORMAL GROWTH OF SOME ANIMALS. DEFICIENCY OR

EXCESS IS ASSOCIATED WITH SERIOUS DISEASE IN LIVESTOCK. ELEMENTAL SELENIUM HAS LOW ACUTE SYSTEMIC TOXICITY, BUT DUST OR FUMES CAN CAUSE SERIOUS IRRITATION OF THE RESPIRATORY TRACT. IT IS A SUSPECTED CARCINOGEN OF THE LIVER AND THYROID. INORGANIC SELENIUM COMPOUNDS CAN CAUSE DERMATITIS. GARLIC ODOR OF BREATH IS A COMMON SYMPTOM. PALLOR, NERVOUSNESS, DEPRESSION, DIGESTIVE DISTURBANCES HAVE BEEN REPORTED IN CASES OF CHRONIC EXPOSURE. SELENIUM COMPOUNDS ARE COMMON AIR CONTAMINANTS. (SAX, DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS)
SELENIUM MAY CAUSE AMYOTROPHIC LATERAL SCLEROSIS, BRONCHIAL IRRITATION, GASTROINTESTINAL DISTRESS, NASOPHARYNGEAL IRRITATION, GARLIC ODOR ON BREATH AND SWEAT, METALLIC TASTE, PALLOR, IRRITABILITY, EXCESSIVE FATIGUE, LOSS OF FINGERNAILS AND HAIR, PULMONARY EDEMA, ANEMIA AND WEIGHT LOSS.

ACUTE AND CHRONIC EFFECTS:

INHALATION:

INHALATION OF SELENIUM DUST OR FUME CAN CAUSE IRRITATION, METALLIC TASTE AND A GARLIC-ODOR TO THE BREATH, BRONCHITIS FEVER..

INGESTION:

MAY CAUSE PALLOR, WEAKNESS, G.I. TRACT DISTURBANCES AND NERVOUSNESS, NAUSEA, VOMITING, SKIN DISCOLORATION, LOSS OF NAILS.

SKIN:

IRRITANT. REPEATED SKIN CONTACT CAN CAUSE DERMATITIS.

EYE:

IRRITANT. SeO_2 IN THE EYE CAN CAUSE A PINK ALLERGIC-TYPE REACTION.

ROUTE OF EXPOSURE:

INHALATION, SKIN, INGESTION

AGGRAVATION OF

PRE-EXISTING CONDITIONS:

PERSON WITH A HISTORY OF ASTHMA, ALLERGIES, OR KNOWN SENSITIZATION TO SELENIUM, OR WITH A HISTORY OF OTHER CHRONIC RESPIRATORY DISEASE, GASTROINTESTINAL DISTURBANCES, DISORDERS OF THE LIVER OR KIDNEYS, OR RECURRENT DERMATITIS WOULD BE EXPECTED TO BE AT INCREASED RISK FROM EXPOSURE

CARCINOGENICITY:

EPA:

NO

IARC:

NO

NTP:

NO

RTECS:

YES

GERMANIUM:

EFFECTS OF EXPOSURE:

LOW TEMPERATURE, LANGUOR, DIARRHEA, CYANOSIS AND EXTREME DEPRESSION OF HEART AND BREATH. EDEMA, LUNG HEMORRHAGE, SPOT HEMORRHAGE FROM SMALL INTESTINAL WALL, PERITONEAL EXTRAVASATION

ACUTE EFFECTS:

INHALATION:

MAY BE IRRITATING

INGESTION:

GENERALLY CONSIDERED OF LOW TOXICITY.

SKIN:

DIRECT CONTACT MAY CAUSE LOCAL IRRITATION.

EYE:

DIRECT CONTACT MAY CAUSE LOCAL IRRITATION
GERMANIUM COMPOUNDS RELATIVELY LOW TOXIC. HIGH DOSES CAUSE DAMAGE TO KIDNEY AND BLADDER INJURY. ACUTE AND CHRONIC TOXICITY IS NOT FULLY KNOWN. EXPOSURE TO DUST OR FUMES OF INORGANIC TIN SALTS IS KNOWN TO CAUSE BENIGN INFLAMMATION OF THE LUNG TISSUE, A CONDITION IN WHICH THERE IS NO DISTINCTIVE

FIBROSIS, NO SIGN OF DISABILITY, NO COMPLICATING FACTORS.

5. FIRST AID MEASURES

INHALATION: REMOVE FROM EXPOSURE, KEEP WARM AND PROVIDE ARTIFICIAL RESPIRATION IF NECESSARY. SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION: DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ATTENTION.

SKIN: REMOVE ANY CONTAMINATED CLOTHING, BRUSH MATERIAL OFF OF SKIN, FLUSH WITH RUNNING WATER, WASH CAREFULLY WITH SOAP AND WATER. SEEK IMMEDIATE MEDICAL ADVICE.

EYE: FLUSH WITH COPIOUS AMOUNTS OF WATER FOR 15 MINUTES. CONSULT A DOCTOR.

6. FIRE FIGHTING MEASURES

FLASH POINT: N/A

FLAMMABLE LIMITS

UPPER: N/A

LOWER: N/A

EXTINGUISHING MEDIA: DO NOT USE WATER, CARBON DIOXIDE OR HALOGENATED EXTINGUISHER. USE CLASS D EXTINGUISHERS FOR POWDER FIRES

SPECIAL FIRE FIGHTING PROCEDURES: WEARFULL FACE SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH EYES AND SKIN.

UNUSUAL FIRE & EXPLOSION HAZARDS: NONE LISTED

7. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: WEAR PROTECTIVE EQUIPMENT. KEEP UNPROTECTED PERSONS AWAY. ENSURE ADEQUATE VENTILATION. SWEEP OR SCOOP UP PIECES. VACUUM UP POWDERS USING VACUUM EQUIPPED WITH HEPA FILTER. DO NOT RAISE DUST.

RESPIRATORY PROTECTION (SPECIFY TYPE): ANY RESPIRATOR APPROVED FOR DUSTS, MISTS, FUMES.

VENTILATION: LOCAL EXHAUST IS REQUIRED FOR SCREENING, HEATING, ETC. MECHANICAL EXHAUST IS NOT RECOMMENDED FOR DUST CONTROL

PROTECTIVE GLOVES: NEOPRENE

EYE PROTECTION: SAFETY GLASSES

OTHER PROTECTIVE EQUIPMENT: NORMAL LAB WEAR.

WASTE DISPOSAL METHOD: IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL WASTE DISPOSAL REGULATIONS.

8. HANDLING AND STORAGE

HANDLING & STORAGE: KEEP CONTAINER TIGHTLY SEALED. ST CONDITIONS TO AVOID: DECOMPOSES IN HNO₃ AND AIR
ORE IN COOL, DRY CONDITIONS IN WELL SEALED CONTAINERS. STORE UNDER LOCK AND KEY AND WITH ACCESS RESTRICTED TO TECHNICAL EXPERTS OR THEIR ASSISTANTS ONLY. STORE AWAY FROM OXIDIZING

OTHER:

AGENTS. ENSURE GOOD VENTILATION AT THE WORKPLACE. OPEN AND HANDLE CONTAINER WITH CARE. 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. MAINTAIN EYEWASH CAPABLE OF SUSTAINED FLUSHING, SAFETY DRENCH SHOWER AND FACILITIES FOR WASHING.

9. STABILITY AND REACTIVITY

STABILITY: STABLE
CONDITIONS TO AVOID: DECOMPOSITION WILL NOT OCCUR IF USED AND STORED ACCORDING TO SPECIFICATIONS. HEATING IN THE PRESENCE OF BROMINE, CHLORINE, FLUORINE, OXYGEN, POTASSIUM CHLORIDE AND POTASSIUM NITRITE

INCOMPATIBILITY (MATERIALS TO AVOID): ACIDS, BASES, OXIDIZERS, K, H₂. HEATING IN THE PRESENCE OF BROMINE, CHLORINE, FLUORINE, OXYGEN, POTASSIUM NITRITE

POTASSIUM CHLORIDE AND HAZARDOUS DECOMPOSITION: H₂Se, Se FUME, SeO₂
HAZARDOUS POLYMERIZATION: DOES NOT OCCUR

10. TOXICOLOGICAL INFORMATION

TO THE BEST OF OUR KNOWLEDGE THE ACUTE AND CHRONIC TOXICITY OF THIS SUBSTANCE IS NOT FULLY KNOWN.

ORAL (RAT): LD50: 6700 MG/KG

CARCINOGENICITY:
EPA D: NOT CLASSIFIABLE AS TO HUMAN CARCINOGENICITY: INADEQUATE HUMAN AND ANIMAL EVIDENCE OF CARCINOGENICITY OR NO DATA ARE AVAILABLE.
IARC-3: NOT CLASSIFIABLE
NTP-2: REASONABLY ANTICIPATED TO BE A CARCINOGEN: LIMITED EVIDENCE FROM STUDIES IN HUMANS OR SUFFICIENT EVIDENCE FROM STUDIES IN EXPERIMENTAL ANIMALS.
THE REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) CONTAINS TUMORIGENIC AND/OR CARCINOGENIC AND/OR NEOPLASTIC DATA FOR COMPONENTS IN THIS PRODUCT.

11. TRANSPORT INFORMATION

D.O.T. REGULATED FOR POWDER

UN NUMBER: 3089
HAZARD CLASS: 4.1
PG III
PROPER SHIPPING NAME: METAL POWDER, FLAMMABLE, N.O.S.
ADR//RID CLASS: 4.1
IMDG CLASS: 4.1
AIR TRAN. ICAO/IATA CLASS: 4.1

12. OTHER INFORMATION

THIS SAFETY DATA SHEET SHOULD BE USED IN CONJUNCTION WITH TECHNICAL SHEETS. IT DOES NOT REPLACE THEM. THE INFORMATION GIVEN IS BASED ON OUR KNOWLEDGE OF THIS PRODUCT, AT THE TIME OF PUBLICATION. IT IS GIVEN IN GOOD FAITH. THE ATTENTION OF THE USER IS DRAWN TO THE POSSIBLE RISKS INCURRED BY USING THE PRODUCT FOR ANY OTHER PURPOSE OTHER THAN THAT FOR WHICH IT WAS INTENDED. THIS DOES NOT IN ANY WAY

EXCUSE THE USER FROM KNOWING AND APPLYING ALL THE REGULATIONS GOVERNING HIS ACTIVITY. IT IS THE SOLE RESPONSIBILITY OF THE USER TO TAKE ALL PRECAUTIONS REQUIRED IN HANDLING THE PRODUCT. THE AIM OF THE MANDATORY REGULATIONS MENTIONED IS TO HELP THE USER TO FULFILL HIS OBLIGATIONS REGARDING THE USE OF HAZARDOUS PRODUCTS.