

LTS RESEARCH LABORATORIES, INC.
MATERIAL SAFETY DATA SHEET
COPPER INDIUM GALLIUM SELENIUM

GENERAL

MANUFACTURER/SUPPLIER: LTS RESEARCH LABORATORIES, INC.

COMPANY'S STREET: 37 RAMLAND ROAD
COMPANY'S CITY: ORANGEBURG
COMPANY'S STATE: NEW YORK
COMPANY'S ZIP CODE: 10962
EMERGENCY CHEMTREC #: 800-262-8200
COMPANY'S EMERGENCY TEL. #: 800-424-9300 (LOCAL)
703-527-3887 (INTERNATIONAL)
COMPANY'S TEL #: 845-494-2940
DATE MSDS PREPARED: 03/30/10
DATE MSDS REVISED: 07/01/11

1. PRODUCT IDENTIFICATION

PRODUCT NAME: COPPER INDIUM GALLIUM SELENIUM
FORMULA: Cu/In/Ga/Se
CAS #: (7440-50-8) / (7440-74-6) / (7440-55-3) / (7782-49-2)
327.046

2. PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT: N/A
MELTING POINT: N/A
SPECIFIC GRAVITY (H₂O=1): N/A
VAPOR DENSITY: N/A
VAPOR PRESSURE: N/A
EVAPORATION RATE: N/A
% VOLATILES: N/A
SOLUBILITY IN H₂O: INSOLUBLE
APPEARANCE AND ODOR: SILVER WITH BRONZE, SOLID SPUTTERING TARGET,
ODORLESS

3. HAZARD IDENTIFICATION

COPPER/INDIUM
HAZARD DESCRIPTION: N/A
RISK PHRASES: N/A
HMIS RATINGS:
HEALTH: 0
FLAMMABILITY: 0
REACTIVITY: 0

GALLIUM
HAZARD DESCRIPTION: CORROSIVE
RISK PHRASES: N/A
HMIS RATINGS:
HEALTH: 2
FLAMMABILITY: 1
REACTIVITY: 1
GHS LABEL:
DANGER: GALLIUM CAUSES SEVERE SKIN BURNS AND EYE DAMAGE.

SELENIUM
HAZARD DESCRIPTION: SELENIUM IS TOXIC
RISK PHRASES: N/A
HMIS RATINGS:
HEALTH: 2

FLAMMABILITY: 0
REACTIVITY: 1
GHS LABEL:
DANGER: SELENIUM IS FATAL IF SWALLOWED OR INHALED. MAY CAUSE DAMAGE TO ORGANS THROUGH PROLONGED OR REPEATED EXPOSURES.

4. FIRE FIGHTING MEASURES

FLASH POINT: N/A
AUTOIGNITION TEMPERATURE: N/A
FLAMMABLE LIMITS:
UPPER: N/A
LOWER: N/A
EXTINGUISHING MEDIA: SPECIAL POWDER FOR METAL FIRES. DO NOT USE WATER.
SPECIAL HAZARDS: IN FIRE, METAL OXIDE FUME

5. HEALTH HAZARD INFORMATION

ACUTE EFFECTS:
SKIN: POWDER: IRRITANT TO SKIN AND MUCOUS MEMBRANES
EYE: POWDER: IRRITATING EFFECT
CHRONIC EFFECTS:
COPPER MAY CAUSE METAL FUME FEVER, HEMOLYSIS OF THE RED BLOOD CELLS AND INJURY TO THE LIVER, LUNGS, KIDNEYS AND PANCREAS.
INDIUM COMPOUNDS MAY CAUSE PAIN IN THE JOINTS AND BONES, TOOTH DECAY, NERVOUS AND GASTROINTESTINAL DISORDERS, HEART PAIN AND GENERAL DEBILITY.
LARGE DOSES OF GALLIUM MAY CAUSE HEMORRHAGIC NEPHRITIS.
SELENIUM MAY CAUSE AMYOTROPHIC LATERAL SCLEROSIS, BRONCHIAL IRRITATION, GASTROINTESTINAL DISTRESS, VASOPHARYNGEAL IRRITATION, GARLIC ODOR ON BREATH AND SWEAT, METALLIC TASTE, LOSS OF FINGERNAILS AND HAIR, ANEMIA AND WEIGHT LOSS.

6. STABILITY

STABILITY: STABLE
CONDITIONS TO AVOID: ACIDS, OXIDIZING AGENTS, HALOGENS, BASES, ALUMINUM/ ALUMINUM ALLOYS.
MATERIAL TO AVOID: NONE KNOWN
DANGEROUS REACTIONS: NONE KNOWN
HAZARDOUS
DECOMPOSITION PRODUCTS: METAL OXIDE FUME

7. EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: REMOVE TO FRESH AIR AND PROVIDE ARTIFICIAL RESPIRATION IF NECESSARY. SEEK IMMEDIATE MEDICAL ADVICE.
INGESTION: SEEK IMMEDIATE MEDICAL ATTENTION.
SKIN: WASH SKIN THOROUGHLY WITH MILD SOAP AND WATER. RINSE THOROUGHLY. SEEK IMMEDIATE MEDICAL ADVICE.
EYE: FLUSH EYES WITH PLENTY OF WATER. SEEK IMMEDIATE MEDICAL ADVICE.

8. HANDLING AND STORAGE

HANDLING & STORAGE: STORE IN A COOL, DRY PLACE IN TIGHTLY SEALED CONTAINERS. ENSURE GOOD VENTILATION. NO SPECIAL REQUIREMENTS ARE NECESSARY IF USED CORRECTLY.

9. SPILL OR LEAK PROCEDURES

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

RESPIRATION: WEAR NIOSH APPROVED DUST-MIST VAPOR RESPIRATOR.
VENTILATION: LOCAL EXHAUST TO MAINTAIN CONCENTRATION AT OR BELOW THE PEL, TLV.

PROTECTIVE GLOVES: RUBBER GLOVES.

EYE PROTECTION: SAFETY GLASSES

PROTECTIVE CLOTHING: PROTECTIVE GEAR SUITABLE TO PREVENT CONTAMINATION.

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

10. TOXICITY DATA

CARCINOGENICITY: NO CLASSIFICATION DATA ON CARCINOGENIC PROPERTIES OF THIS MATERIAL IS AVAILABLE FROM THE EPA, IARC, NTP, OSHA, OR ACGIH.

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

11. TRANSPORTATION DATA

COPPER/INDIUM

UN NUMBER: NONE

HAZARD CLASS: NONE

ADR/RID CLASS: NONE

IMDG CLASS: NONE

ICAO/IATA CLASS: NONE

GALLIUM

PROPER SHIPPING NAME: GALLIUM

UN NUMBER: 2803

HAZARD CLASS: 8

PACKING GROUP: III

ADR/RID CLASS: 8 (C10) CORROSIVE SUBSTANCES

IMDG CLASS: 8

ICAO/IATA CLASS: 8

SELENIUM

PROPER SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.

UN NUMBER: 3077

HAZARD CLASS: 9

PACKING GROUP: III

ADR/RID CLASS: 9 (M7) MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES

IMDG CLASS: 9

ICAO/IATA CLASS: 9

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.

