



MATERIAL SAFETY DATA SHEET

PRODUCT NAME: AMTIR-1

CHEMICAL NAME: AMTIR-1

CHEMICAL FORMULA: Ge₃₃ As₁₂ Se₅₅

INGREDIENTS (TYPICAL VALUES - NOT SPECIFICATIONS):

Germanium 33%

Arsenic 12%

Selenium 55%

PRODUCT CLASSIFIED AS: Non-hazardous

WARNING STATEMENT: None considered necessary

SECTION 1 – PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: N.A.(*) Solubility in water: Insoluble

VAPOR PRESSURE: N.A. Specific gravity: 4.4

VAPOR DENSITY (AIR = 1): N.A. % volatile (by volume): 0

APPEARANCE: Dark-colored glassy metallic solid

SECTION 2 – FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: N.A. Extinguishing media: N.A.

FLAMMABLE LIMITS (SIP IN AIR): LFL = N.A.; UFL = N.A.

SPECIAL FIREFIGHTING EQUIPMENT AND HAZARDS: None required. Use extinguishing method appropriate for fire in surrounding area.

SECTION 3 – REACTIVITY DATA

STABILITY: Stable Compound

INCOMPATIBILITY: None known

HAZARDOUS DECOMPOSITION PRODUCTS: None known

HAZARDOUS POLYMERIZATION: N.A.

SECTION 4 – HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE (TLV): A TLV has not been established for AMTIR-1. Neither has OSHA set a permissible exposure limit (PEL). Recommended exposure levels for individual components are as follows.

Arsenic Compounds; 0.01 milligrams per cubic meter of air determined as a time-weighted average (TWA) exposure for up to 8-hours. (Source: OSHA 1910.1000, Subpart Z, Table Z-1, revised).

Selenium Compounds; 0.2 milligrams per cubic meter of air determined as a TWA exposure of up to 8-hours. (Source: OSHA 1910.1000, Subpart Z, Table Z-1, revised).

Germanium Compounds; Neither a PEL nor a TLV has been adopted for germanium and its compounds (except for germanium tetrahydride).

POSSIBLE EFFECTS OF OVEREXPOSURE: No adverse health effects should occur from exposure to AMTIR-1 material. Under extreme conditions, individual components of AMTIR-1 material may cause non-specific symptoms, such as, nausea, vomiting, diarrhea, hot flashes and progressive anxiety. Such symptoms are not expected to occur and are seldom experienced. Separation of the AMTIR-1 material into the individual components is not expected to occur under normal processing operations.

SECTION 5 – FIRST AID PROCEDURES

EYES: Flush with flowing water for 15 minutes after contact with dust or fumes.

SKIN: Flush with plenty of water after contact with dust or fumes.

INHALATION: If ill effects develop, remove person to fresh air, keep person warm and quiet. Seek medical help.

INGESTION: Not a problem. If material is swallowed, induce vomiting. Seek medical help

SECTION 6 – SPECIAL HANDLING INFORMATION

VENTILATION: Should be sufficient to remove any dusts, mists or odors that may evolve during processing.

Forced exhaust air of 100 lineal feet per minute (lfm) face velocity should be adequate.

Avoid breathing any fumes or dusts that may be generated because of arsenic or selenium content.

Respiratory protection: Not required if adequate ventilation is provided. In unventilated areas a high efficiency respirator approved for toxic dusts, should be used.

Protective clothing: Rubber gloves and plastic aprons should be provided during abrasive polishing operations.

(*) N.A. - Not applicable

Eye protection: Chemical workers goggles or plastic face shields should be used to provide eye protection from dusts, fumes, mists or flying particles should product break or fragment.

SECTION 7 - SPECIAL PRECAUTIONS AND ADDITIONAL INFORMATION

No special safety precautions are required in handling, storing or processing AMTIR-1. However, mechanical polishing may cause emission of unpleasant sulfide-like or selenide-like odors. This does not represent a significant exposure or represent a health hazard as the threshold of smell for these odors is much lower than the TLV's established for the individual components. increasing the exhaust ventilation will remove the odor problem. The odor's cause is thought to be more related to the abrasive sludge than to any decomposition of the product material.

SPECIAL NOTE: This Material Safety Data Sheet is considered to be an essentially similar form to OSHA Form-20 (a nonmandatory form) and is submitted in lieu thereof.

This data is furnished gratuitously, independent of any sale of the product only for your investigation and independent verification. While the information is believed to be correct, AMORPHOUS MATERIALS, INC. makes no representation as to the absolute accuracy of the information contained herein.
