

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: **ARSENIC TRISULFIDE GLASS**

PRODUCT DESCRIPTION: INFRARED TRANSMITTING GLASS

CAS No.: 1303-33-9

INGREDIENTS (Typical Values - Not Specifications):

Arsenic (CAS 7440-38-2) 60. 9%

Sulfur (CAS 7704-34-9) 39.1%

PRODUCT CLASSIFIED AS: NON-HAZARDOUS

DOT WARNING STATEMENT: NONE CONSIDERED NECESSARY

SECTION 1 - PHYSICAL DATA

BOILING POINT: n. a.

SOLUBILITY: Insoluble in water and acids. Accelerated testing showed no changes after 7-day exposure to water (Ref. 1). Concentrated hydrochloric acid shows no effect after 12 hours. The glass may be attacked by alkaline solutions (Ref. 2).

VAP. PRESSURE: n.a. SP. GRAVITY: 3.198

VAP. DENSITY (AIR=1): n.a. * VOLATILE (BY VOL.): 0

APPEARANCE: Ruby red, glassy looking, soft, brittle, somewhat fragile, non-odorous.

SPECIAL NOTE: The physical characteristics of naturally occurring arsenic trisulfide (called orpiment, auriferous pigment, arsenic yellow, king's yellow, king's gold) (Ref. 3) are considerably different from ARSENIC TRISULFIDE GLASS, a manufactured product. Mineral arsenic trisulfide is a crystalline material while ARSENIC TRISULFIDE GLASS is amorphous. Amorphous forms of materials generally are more inert than crystalline forms.

n.a. means "Not Applicable."

SECTION 2 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: n.a.

FLAMMABLE LIMITS (STP IN AIR): LFL, n.a. ; UFL, n.a.

EXTINGUISHING MEDIA: n.a.

SPECIAL FIRE FIGHTING EQUIPMENT AND HAZARDS: No special techniques required. Use extinguisher type suitable for surrounding fire.

SPECIAL NOTE: Fire, explosion and reactivity hazard information found in the literature for the mineral arsenic trisulfide does not apply to ARSENIC TRISULFIDE GLASS, which is a stable product exhibiting no flammable properties. It is not easily oxidized as is naturally occurring arsenic trisulfide. Therefore, no special handling, storage or transportation precautions for fire prevention or extinguishment is required for ARSENIC TRISULFIDE GLASS.

SECTION 3 - REACTIVITY DATA

STABILITY: Stable Compound

INCOMPATIBILITY: None known

HAZARDOUS DECOMPOSITION PRODUCTS: None known

HAZARDOUS POLYMERIZATION: n.a.a

SPECIAL NOTE: Reactivity information found in the literature pertaining to the mineral form of arsenic trisulfide does not apply to ARSENIC TRISULFIDE GLASS. The arsenic and sulfur in the amorphous glass product is tightly bound and will not combine with the several chemical materials said to have adverse reactions with the naturally occurring form of arsenic trisulfide. ARSENIC TRISULFIDE GLASS is a stable, non-deteriorating, homogeneous glass. (Ref. 4). Stability and optical characteristics of ARSENIC TRISULFIDE GLASS is also discussed in University of Michigan Research Report No. 2389-11-S and 2389-11-S (Ref. 5; Ref. 6).

SECTION 4 - SPILL, LEAK AND DISPOSAL PROCEDURES

ACTION TO TAKE FOR SPILLS: Contain spill. The bulk of any liquid spill will most likely come from spill of polishing or grinding compound sludge. Abraded particles of ARSENIC TRISULFIDE GLASS material will be a minor contaminant in the spill. Clean up and transfer spilled material to separate container for recovery or disposal.

WASTE DISPOSAL METHOD: Store ARSENIC TRISULFIDE GLASS waste in a covered container with other arsenic containing waste materials such as gallium arsenide or AMTIR I and make proper disposal as a hazardous waste.

n.a. means "Not Applicable."

Arsenic is regulated as a hazardous waste/material under CERCLA/RCRA regulations. Therefore, it must be disposed of in a 'permitted' hazardous waste facility in compliance with EPA and/or other applicable local, state and federal regulations applicable at the time of disposal and should be handled in a manner acceptable to good waste management practice (RQ = 100 pounds for EP toxicity - arsenic) .

SECTION 5 - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE (TLV): A TLV has not been established for ARSENIC TRISULFIDE GLASS.

Recommended exposure levels for individual components are as follows:

Arsenic, Inorganic Compounds (as AS) : 10 micrograms (as As) per cubic meter of air determined as a TWA exposure averaged over any 8-hour period (Ref. 7).

Sulfur: No TWA or PEL established. Personal exposure should be limited to that of a nuisance dust (5 mg/M³) as specified in Reference 8 (Ref. 9).

POSSIBLE EFFECTS OF OVEREXPOSURE: No adverse health effects should occur from exposure to ARSENIC TRISULFIDE GLASS. Under extreme conditions, individual components of ARSENIC TRISULFIDE GLASS material could possibly (although not likely) cause non-specific symptoms, such as nausea, vomiting, diarrhea, hot flashes or progressive anxiety. If heated to temperatures greater than 500 C°, decomposition of the product may allow the sulfur to react slowly with the atmosphere to form SO₂. This is not a violent reaction. For this reason, prudence suggests that good general ventilation should be used with local exhaust ventilation added as may become necessary.

SECTION 6 - FIRST AID

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

SKIN: Flush with water after contact with dust, sludge or fumes.

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

INGESTION: Should not be a problem. Expected effects would be the same as if any other glass product was ingested. If material is swallowed, induce vomiting. Seek medical help immediately.

SECTION 7 - SPECIAL HANDLING INFORMATION

VENTILATION: Ventilation should be provided sufficient to remove any dusts, mists or odors that may evolve during processing. Local exhaust air removal of 100 lineal feet per minute (lfm) face velocity should be adequate. Avoid breathing any fumes or dusts that may be generated because of possible arsenic or sulfur content.

RESPIRATORY PROTECTION: Ordinarily, respiratory protection is 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. ARSENIC SULFIDE GLASS is not absorbed through the skin. Personal protective equipment is recommended to avoid contact with grinding sludge which may contain other contaminants that could cause adverse skin or health effects.

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 during processing operations.

SECTION 8 - SECTION 313 SUPPLIER NOTIFICATION

This product contains the following 'listed' chemical subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372.

CAS # 7440-38-2

Chemical Name: Arsenic

Percent by Weight: 60.9%

SECTION 9 - REFERENCES

1. IR TRANSMITTING OPTICAL GLASS TRG1, Information No. 61-1968, Jenaer Glaswerk Schott & Gen., West Germany, April 1968.
2. IRG1 Arsenic Trisulfide Glass, INFRARED TRANSMITTING OPTICAL MATERIALS, Schott Optical Glass, Inc., Duryea, Pennsylvania, 1971.
3. THE MERCK INDEX, 11th Ed., Merck & Co., Inc., Rahway, New Jersey, 1989 (p. 837).
4. "Servofrax Arsenic Trisulfide Glass," BROCHURE TDS-R-4, Servo Corporation of America, Hicksville, New York, 1986.

5. "Arsenic Trisulfide Glass," OPTICAL MATERIALS FOR INFRARED INSTRUMENTATION, Report No. 2389-11 S, Stanley S. Ballard and Kathryn A. McCarthy and William L. Wolfe, Institute of Science & Technology, University of Michigan, Ann Arbor Michigan, 1959 (p. 32).
6. OPTICAL MATERIALS FOR INFRARED INSTRUMENTATION, Supplement 1, Report No. 2389-11-S1, Institute of Science & Technology, University of Michigan, Ann Arbor, Michigan, 1961.
7. "Title 29 CFR 1910.1018(c)," OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR GENERAL INDUSTRY, Occupational Safety and Health Administration, U. S. Department of Labor, Washington, D.C., 1989.
8. HAZARDOUS CHEMICALS DESK REFERENCE, N. Irving Sax and Richard J. Lewis, Sr., Van Nostrand Reinhold Company, New York, 1987 (p. 795).
9. "Air Contaminants - Permissible Exposure Limits, Table Z-3," OSHA 3112, Occupational Safety and Health Administration, U. S. Department of Labor, Washington, D.C., 1989.

SPECIAL NOTE: 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 accuracy of the information contained herein.

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