

MATERIAL
SAFETY
DATA SHEET

PRODUCT NAME Germane	CAS# 7782-65-2
TRADE NAME AND SYNONYMS Germane, Monogermane, Germanium Hydride	DOT I.D. NO. UN 2192
CHEMICAL NAME AND SYNONYMS Germanium, Tetrahydride	DOT HAZARD CLASS Division 2.3
ISSUE DATE AND REVISIONS Revised April 2007	FORMULA GeH ₄

HEALTH HAZARD DATA

EMERGENCY OVERVIEW

Germane is a toxic, flammable liquid and gas under pressure. People may be fatal if inhaled. Germane causes severe blood, liver, kidney, and other organ damage. But symptoms may be delayed. Germane may form explosive mixtures with air, ignite on contact with air and suspect cancer hazard. So self-contained breathing apparatus must be worn by rescue workers.

SYMPTOMS OF EXPOSURE

Inhalation: May be fatal if inhaled. Severely irritates the upper respiratory tract, resulting in coughing, choking, and a feeling of fullness in the center of the chest. Delayed symptoms may include pulmonary edema, massive hemolysis, cyanosis, kidney failure, liver damage, and liver and spleen enlargement.

Skin Contact: May cause slight discomfort from a slight irritation seen as a mild local redness.

Swallowing: A highly unlikely route of exposure. This product is a gas at normal temperature and pressure.

Eye Contact: Irritates the eyes, causing redness and swelling of the conjunctive with excess blinking and tear production.

TOXICOLOGICAL PROPERTIES

Germane is a strong hemolytic agent. Repeated (chronic) overexposure may damage the kidneys, liver, blood cells, and respiratory tract. It may be anticipated to cause hemolysis and renal damage after significant exposure.

RECOMMENDED FIRST AID TREATMENT

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO GERMANE. RESCUERS SHOULD BE EQUIPPED WITH ADEQUATE PERSONAL PROTECTIVE APPARATUS.

Inhalation: Immediately remove to fresh air. If not breathing, give artificial respiration. Avoid breathing exhaled air from victim. If breathing is difficult, qualified personnel may give oxygen. Call a physician. Further treatment should be symptomatic and supportive.

Swallowing: An unlikely route of exposure. This product is a gas at normal temperature and pressure.

Skin Contact: Immediately flush skin with plenty of water while removing contaminated clothing and shoes. Call a physician. Wash clothing before wearing again.

Eye Contact: Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

Germane is a poisonous, flammable gas. This gas may ignite spontaneously in air. Forms explosive mixtures with air and oxidizing agents. Heat of fire can build pressure in cylinder and cause it to rupture. If leaking gas catches fire, do not extinguish flames. Flammable and toxic vapors may spread from leak and could explode if reignited by sparks or flames.

PHYSICAL DATA

BOILING POINT -127.1 °F (-88.4 °C)	CRITICAL TEMPERATURE 94.7 °F (34.8 °C)
VAPOR PRESSURE 594.6 psia (4099.62 kPa) at 70 °F (21.1 °C)	GAS DENSITY AT 700F, 1 atm .214 lb/ft ³ (3.420 kg/m ³)
SOLUBILITY IN WATER Negligible	FREEZING POINT -265 °F (-165 °C)
EVAPORATION RATE (Butyl Acetate =1) Not applicable	SPECIFIC GRAVITY (AIR=1) 2.85 at 70 °F (21.1 °C) and 1 atm
APPEARANCE AND ODOR Colourless gas at normal temperature and pressure, pungent odor.	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Test Method) Flammable Gas	AUTO IGNITION TEMPERATURE Unknown	FLAMMABLE LIMITS % BY VOLUME LEL N/A UEL N/A
EXTINGUISHING MEDIA CO ₂ , dry chemical, water spray, or fog.		
SPECIAL FIRE FIGHTING PROCEDURES Evacuate all personnel from danger area. Do not approach area without self-contained breathing apparatus and protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS If leaking gas catches fire, do not extinguish flames. Flammable and toxic vapors may spread from leak and could explode if reignited by sparks or flames.		

REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID Temperatures in excess of 662 °F (350 °C)
Unstable	X	
Stable		
INCOMPATIBILITY (Materials to avoid) Air, oxidizing agents, halogens, halogenated compounds.		
HAZARDOUS POLYMERIZATION		HAZARDOUS DECOMPOSITION PRODUCTS Germanium, germanium oxides, hydrogen.
May Occur		
Will Not Occur	X	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Immediately evacuate all personnel from affected area. Do not approach area without self-contained breathing apparatus and protective clothing. Forms explosive mixtures with air. Poisonous, flammable vapors may spread from spill. Prevent runoff from contaminating surrounding environment. Remove all sources of ignition if without risk.
WASTE DISPOSAL METHOD Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. For emergency disposal assistance, contact HSG for specific advice.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) Use air-supplied respirators for concentrations up to 10 times the applicable permissible exposure limit. For higher concentrations, a full-face, self-contained breathing apparatus is required.	
VENTILATION See Local Exhaust	SPECIAL Forced draft fume hood is preferred.
MECHANICAL (Gen.) N/A	OTHER N/A
LOCAL EXHAUST Inadequate	MECHANICAL (Gen.) Inadequate
PROTECTIVE GLOVES Neoprene	
EYE PROTECTION Wear safety goggles or glasses when handling cylinders.	
OTHER PROTECTIVE EQUIPMENT Metatarsal shoes for cylinder handling and protective clothing where needed.	

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION DOT Shipping Name: Germane DOT Shipping Label: Toxic, flammable Gas	DOT Hazard Class: Division 2.3 I.D. No.: UN 2192
SPECIAL HANDLING RECOMMENDATIONS Protect cylinders from damage. Use a suitable hand truck to move cylinders; Do not drag, slide or roll cylinders. Electrical equipment must be non-sparking or explosion-proof. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object into cap openings; doing so may damage the valve and cause a leak.	
SPECIAL STORAGE RECOMMENDATIONS Store and use with adequate ventilation. Separate germane cylinders from oxygen and other oxidizers by at least 20 feet or use a barricade of noncombustible material. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125°F (52°C). store full and empty cylinders separately. Use a “first in-first out” inventory system to prevent full cylinders being stored for excessive periods of time.	
SPECIAL PACKAGING RECOMMENDATIONS Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.	
OTHER RECOMMENDATIONS OR PRECAUTIONS Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Law.	

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