

MATERIAL SAFETY DATA SHEET

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Version 1.5

Section 1 - Product and Company Information

Product Name 2-BROMO-2-CHLORO-1,1,1-TRIFLUOROETHANE
Product Number B4388
Brand SIGMA

Company Sigma-Aldrich
Address 3050 Spruce Street
SAINT LOUIS MO 63103 US

Technical Phone: 800-325-5832
Fax: 800-325-5052
Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
2-BROMO-2-CHLORO-1,1,1-TRIFLUOROETHANE	151-67-7	No

Formula C2HBrClF3
Synonyms Bromochlorotrifluoroethane *
1-Bromo-1-chloro-2,2,2-trifluoroethane *
2-Bromo-2-chloro-1,1,1-trifluoroethane *
Chalothane * Ethane,
1-bromo-1-chloro-2,2,2-trifluoro- * Fluorotane *
Fluothane * Ftorotan (Russian) * Halotan *
Halothane (ACGIH) * Halsan * Narcotane *
Narcotann NE-spofo (Russian) *
1,1,1-Trifluoro-2-bromo-2-chloroethane *
1,1,1-Trifluoro-2-chloro-2-bromoethane *
2,2,2-Trifluoro-1-chloro-1-bromoethane

RTECS Number: KH6550000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Toxic.

May cause harm to the unborn child. Risk of serious damage to eyes. Irritating to respiratory system and skin.

Target organ(s): Central nervous system. Cardiovascular system. Kidneys. Liver. Calif. Prop. 65 developmental hazard.

HMIS RATING

HEALTH: 2*

FLAMMABILITY: 0

REACTIVITY: 1

NFPA RATING

HEALTH: 2

FLAMMABILITY: 0

REACTIVITY: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE

In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

FLASH POINT

N/A

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

SPECIAL REQUIREMENTS

Explosion Limits	N/A
Flammability	N/A
Autoignition Temp	N/A
Refractive Index	1.369
Optical Rotation	N/A
Miscellaneous Data	N/A
Solubility	N/A

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions of Instability: May decompose on exposure to light.

Materials to Avoid: Strong oxidizing agents, Rubber, Plastics, Chemically active metals.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Hydrogen chloride gas, Hydrogen bromide gas, Hydrogen fluoride.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes severe eye irritation.

Inhalation: Material is irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Kidneys. Liver. Central nervous system. Cardiovascular system.

SIGNS AND SYMPTOMS OF EXPOSURE

Exposure can cause: Narcotic effect. Dizziness. Unconsciousness.

Confusion. Drowsiness. Causes a fall in blood pressure.

TOXICITY DATA

Oral

Rat

6,700 mg/kg

LD50

Inhalation

Human

7,000 ppm

LCLO

Remarks: Gastrointestinal: Nausea or vomiting. Liver: Hepatitis (hepatocellular necrosis), diffuse. Nutritional and Gross Metabolic: Changes in: Body temperature increase.

Intravenous

Man

129 MG/KG

LDLO

Remarks: Cardiac: Change in rate. Behavioral: General anesthetic. Lungs, Thorax, or Respiration: Cyanosis.

Oral
Rat
5680 mg/kg
LD50
Remarks: Behavioral:Excitement. Behavioral:Antipsychotic.

Inhalation
Rat
29,000 ppm
LC50

Inhalation
Mouse
98,000 mg/m3
LC50
Remarks: Liver:Other changes. Brain and Coverings:Other degenerative changes. Kidney, Ureter, Bladder:Other changes.

Oral
Guinea pig
6000 mg/kg
LD50
Remarks: Behavioral:Antipsychotic. Behavioral:Excitement.

IRRITATION DATA

Eyes
Rabbit
100 mg
Remarks: Severe irritation effect

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

ACGIH CARCINOGEN LIST

Rating: A4

CHRONIC EXPOSURE - TERATOGEN

Species: Mouse
Dose: 500 ppm/4H 500 ppm/4HR
Route of Application: Inhalation
Exposure Time: Daily 9 weeks
Species: Mouse
Dose: 500 ppm/ 2H 500 ppm/ 2HR
Route of Application: Inhalation
Exposure Time: Daily 9 weeks
Species: Mouse
Dose: 1000 ppm/4H 1000 ppm/4HR
Route of Application: Inhalation
Exposure Time: Daily 9 weeks

Species: Rat
Dose: 8000 PPM/12H
Route of Application: Inhalation
Exposure Time: (9D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).
Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat
Dose: 1600 PPM/8H
Route of Application: Inhalation
Exposure Time: (1-21D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 10 PPM/8H
Route of Application: Inhalation
Exposure Time: (1-22D PREG)
Result: Specific Developmental Abnormalities: Central nervous system. Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material).

Species: Rat
Dose: 10 PPM/8H
Route of Application: Inhalation
Exposure Time: (1-22D PREG)
Result: Specific Developmental Abnormalities: Urogenital system. Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material).

Species: Mouse
Dose: 1 PPH/3H
Route of Application: Inhalation
Exposure Time: (13D PREG)
Result: Specific Developmental Abnormalities: Other developmental abnormalities. Specific Developmental Abnormalities: Craniofacial (including nose and tongue). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 3000 PPM/4H
Route of Application: Inhalation
Exposure Time: (9W PRE/1-17D PREG)
Result: Specific Developmental Abnormalities: Urogenital system.

CHRONIC EXPOSURE - MUTAGEN

Species: Human
Dose: 1 PPH/48H-C
Cell Type: lymphocyte
Mutation test: Cytogenetic analysis

Species: Rat
Route: Oral
Dose: 4 MMOL/KG
Mutation test: Micronucleus test

Species: Rat
Route: Inhalation
Dose: 1000 PPM
Exposure Time: 2H
Mutation test: Unscheduled DNA synthesis

Species: Rat
Route: Oral
Dose: 10 GM/KG
Mutation test: Unscheduled DNA synthesis

Species: Mouse
Route: Inhalation
Dose: 1 PPH/1H
Mutation test: Other mutation test systems

Species: Mouse
Route: Inhalation
Dose: 8000 PPM
Exposure Time: 24H
Mutation test: DNA inhibition

Species: Mouse
Dose: 1000 PPM
Cell Type: fibroblast
Mutation test: Cytogenetic analysis

Species: Hamster
Dose: 1 PPH
Cell Type: fibroblast
Mutation test: Other mutation test systems

Species: Hamster
Dose: 1 PPH/48H-C
Cell Type: lung
Mutation test: Cytogenetic analysis

Species: Chicken
Route: Parenteral
Dose: 10 MG
Mutation test: Cytogenetic analysis

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 100 PPM/8H
Route of Application: Inhalation
Exposure Time: (2-22D PREG/30D POST)
Result: Effects on Newborn: Behavioral.

Species: Rat
Dose: 8000 PPM/6H
Route of Application: Inhalation
Exposure Time: (7-9D PREG)
Result: Effects on Fertility: Abortion.

Species: Mouse
Dose: 3000 PPM/4H
Route of Application: Inhalation
Exposure Time: (9W PRE/1-21D PREG)
Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth). Effects on Fertility: Other measures of fertility

Species: Mouse
Dose: 1000 PPM/4H
Route of Application: Inhalation
Exposure Time: (9W PRE/1-21D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Species: Mouse
Dose: 14000 PPM/1H

Route of Application: Inhalation
Exposure Time: (8-10D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse
Dose: 15000 PPM/40M
Route of Application: Inhalation
Exposure Time: (3W PRE)
Result: Maternal Effects: Other effects. Effects on Newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4). Effects on Newborn: Other postnatal measures or effects.

Section 12 - Ecological Information

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Aviation Regulated Liquid, N.O.S.
UN#: 3334
Class: 9
Packing Group: Packing Group III
Hazard Label: Class 9
PIH: Not PIH

IATA

Proper Shipping Name: Aviation Regulated Liquid, N.O.S.
IATA UN Number: 3334
Hazard Class: 9

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION

Symbol of Danger: T
Indication of Danger: Toxic.
R: 61-41-37/38
Risk Statements: May cause harm to the unborn child. Risk of serious damage to eyes. Irritating to respiratory system and skin.
S: 53-23-26-36/37-45
Safety Statements: Avoid exposure - obtain special instructions before use. Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing and gloves. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Toxic.
Risk Statements: May cause harm to the unborn child. Risk of serious damage to eyes. Irritating to respiratory system and

skin.

Safety Statements: Do not breathe vapor. Wear suitable protective clothing. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

US Statements: Target organ(s): Central nervous system. Cardiovascular system. Kidneys. Liver. Calif. Prop. 65 developmental hazard.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65

California Prop - 65: This product is or contains chemical(s) known to the state of California to cause developmental toxicity.

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: No

NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2006 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.