

**1 Identification of substance****Product details**

Trade name

**1-Bromo-4,4,4-trifluorobutane**

Stock number:

L10237

Manufacturer/Supplier:

Alfa Aesar GmbH & Co.KG  
Benzstrasse 3  
D-76185 Karlsruhe / GermanyE-mail: gcat@matthey.com  
www.alfa-chemcat.com

Informing department:

Product safety department.

Emergency information:

Giftnotruf Universität Mainz / Poison Information Center Mainz  
www.giftinfo.uni-mainz.de Telefon:+49(0)6131/19240**2 Hazards identification**

Hazard designation:



Xi Irritant

Information pertaining to particular dangers  
for man and environment  
GHS label elements

R 36/37/38 Irritating to eyes, respiratory system and skin.

**Warning**

Prevention:

Response:

H315 - Causes skin irritation.  
 H319 - Causes serious eye irritation.  
 H335 - May cause respiratory irritation.  
 P261 Avoid breathing dust/fume/gas/mist/vapours/spray.  
 P302+P352 IF ON SKIN: Wash with plenty of soap and water.  
 P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P321 Specific treatment (see on this label).

Storage:

Disposal:

P405 Store locked up.  
 P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**3 Composition/information on ingredients**

Chemical characterization:

Designation: (CAS#)

1-Bromo-4,4,4-trifluorobutane (CAS# 406-81-5): 100%

**4 First aid measures**

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.

After skin contact

Seek immediate medical advice.  
Instantly wash with water and soap and rinse thoroughly.

After eye contact

Seek immediate medical advice.

After swallowing

Rinse opened eye for several minutes under running water. Then consult doctor.  
Seek immediate medical advice.**5 Fire fighting measures**Suitable extinguishing agents  
Special hazards caused by the material, its  
products of combustion or flue gases:CO<sub>2</sub>, extinguishing powder or water jet. Fight larger fires with water jet or alcohol-resistant foam.

Protective equipment:

Can be released in case of fire:  
 Carbon monoxide and carbon dioxide  
 Hydrogen fluoride (HF)  
 Hydrogen bromide (HBr)  
 Wear self-contained breathing apparatus.  
 Wear full protective suit.

**6 Accidental release measures**

Person-related safety precautions:

Wear protective equipment. Keep unprotected persons away.

Measures for environmental protection:

Ensure adequate ventilation

Measures for cleaning/collecting:

Do not allow material to be released to the environment without proper governmental permits.  
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).  
Ensure adequate ventilation.

Additional information:

See Section 7 for information on safe handling  
 See section 8 for information on personal protection equipment.  
 See Section 13 for information on disposal.

**7 Handling and storage**

Handling

Information for safe handling:

Keep containers tightly sealed.  
 Store in cool, dry place in tightly closed containers.  
 Ensure good ventilation/exhaustion at the workplace.

Information about protection against  
explosions and fires:

Keep ignition sources away - Do not smoke.

Storage  
Requirements to be met by storerooms and  
containers:

No special requirements.

Information about storage in one common  
storage facility:

Store away from oxidizing agents.

Further information about storage  
conditions:

Keep container tightly sealed.  
 Store in cool, dry conditions in well sealed containers.

**8 Exposure controls and personal protection**Additional information about design of  
technical systems:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with critical values that require  
monitoring at the workplace:  
Additional information:

Not required.  
 No data

Personal protective equipment  
General protective and hygienic measures

The usual precautionary measures should be adhered to in handling the chemicals.  
 Keep away from foodstuffs, beverages and food.  
 Instantly remove any soiled and impregnated garments.  
 Wash hands during breaks and at the end of the work.  
 Avoid contact with the eyes and skin.

**Safety Data Sheet**  
according to 1907/2006/EC, Article 31

Revision: 22.08.2010

Printing date 22.08.2010

**Trade name 1-Bromo-4,4,4-trifluorobutane**

<b>Breathing equipment:</b>	Use breathing protection with high concentrations.	(Contd. of page 1)
<b>Protection of hands:</b>	Check protective gloves prior to each use for their proper condition.	
<b>Material of gloves</b>	The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.	
<b>Penetration time of glove material</b>	Impervious gloves	
<b>Eye protection:</b>	Not determined	
	Safety glasses	
	Face protection	
<b>Body protection:</b>	Protective work clothing.	

**9 Physical and chemical properties:**

<b>General Information</b>	
<b>Form:</b>	Liquid
<b>Colour:</b>	Colourless
	Yellow
<b>Smell:</b>	Not determined
<b>Change in condition</b>	
<b>Melting point/Melting range:</b>	Not determined
<b>Boiling point/Boiling range:</b>	103-105°C
<b>Sublimation temperature / start:</b>	Not determined
<b>Flash point:</b>	Not determined
<b>Ignition temperature:</b>	Not determined
<b>Decomposition temperature:</b>	Not determined
<b>Danger of explosion:</b>	Product is not explosive.
<b>Critical values for explosion:</b>	
<b>Lower:</b>	Not determined
<b>Upper:</b>	Not determined
<b>Steam pressure:</b>	Not determined
<b>Density at 20°C</b>	1.555 g/cm <sup>3</sup>
<b>Solubility in / Miscibility with Water:</b>	Not miscible or difficult to mix

**10 Stability and reactivity**

<b>Thermal decomposition / conditions to be avoided:</b>	No decomposition if used and stored according to specifications.
<b>Materials to be avoided:</b>	Oxidizing agents
<b>Dangerous reactions:</b>	No dangerous reactions known
<b>Dangerous products of decomposition:</b>	Carbon monoxide and carbon dioxide Hydrogen fluoride Hydrogen bromide

**11 Toxicological information**

<b>Acute toxicity:</b>	
<b>Primary irritant effect:</b>	
<b>on the skin:</b>	Irritant for skin and mucous membranes.
<b>on the eye:</b>	Irritant effect.
<b>Sensitization:</b>	No sensitizing effect known.
<b>Additional toxicological information:</b>	To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

**12 Ecological information:**

<b>Additional ecological information:</b>	
<b>General notes:</b>	Generally not hazardous for water. Do not allow material to be released to the environment without proper governmental permits.


**13 Disposal considerations**

<b>Product:</b>	
<b>Recommendation</b>	Hand over to disposers of hazardous waste. Must be specially treated under adherence to official regulations. Consult state, local or national regulations for proper disposal.
<b>Uncleaned packagings:</b>	
<b>Recommendation:</b>	Disposal must be made according to official regulations.

**14 Transport information**

<b>Land transport ADR/RID and GGVS/GGVE (cross-border/domestic)</b>	
<b>ADR/RID-GGVS/E Class:</b>	None
<b>Maritime transport IMDG/GGVSea:</b>	
<b>IMDG/GGVSea Class:</b>	None
<b>Marine pollutant:</b>	No
<b>Air transport ICAO-TI and IATA-DGR:</b>	
<b>ICAO/IATA Class:</b>	None
<b>Transport/Additional information:</b>	Not dangerous according to the above specifications.

**15 Regulatory information**

<b>Designation according to EC guidelines:</b>	
<b>Code letter and hazard designation of product:</b>	 Xi Irritant
<b>Risk phrases:</b>	36/37/38 Irritating to eyes, respiratory system and skin.
<b>Safety phrases:</b>	26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

(Contd. on page 3)

**Safety Data Sheet**  
according to 1907/2006/EC, Article 31

Printing date 22.08.2010

Revision: 22.08.2010

Trade name **1-Bromo-4,4,4-trifluorobutane**

37 Wear suitable gloves.

(Contd. of page 2)

**National regulations****Information about limitation of use:**

For use only by technically qualified individuals.  
Employment restrictions concerning young persons must be observed.

**Water hazard class:**

Generally not hazardous for water.

**16 Other information:**

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing data specification sheet:** Health, Safety and Environmental Department.**Contact:** Zachariah Hólt**Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)  
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)  
IMDG: International Maritime Code for Dangerous Goods  
IATA: International Air Transport Association  
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)  
ICAO: International Civil Aviation Organization  
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)  
GHS: Globally Harmonized System of Classification and Labelling of Chemicals  
CAS: Chemical Abstracts Service (division of the American Chemical Society)

GB