BOC
A Member of The Linde Group

SAFETY DATA SHEET

 # 1868

Product Name **6 COMPONENT MIXTURE (C4H10S, C2H6S, C3H8S, H2S, N2, BALANCE CH4)**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier name	**BOC LIMITED (AUSTRALIA)**
Address	10 Julius Avenue, North Ryde, NSW, 2113, AUSTRALIA
Telephone	131 262, (02) 8874 4400
Fax	132 427 (24 hours)
Emergency	1800 653 572 (24/7) (Australia only)
	http://www.boc.com.au
Synonym(s)	1868 - MSDS NUMBER • PRODUCT CODE: 292 • SPECIAL GAS MIXTURE
Use(s)	CALIBRATION • INDUSTRIAL APPLICATIONS
SDS date	13 November 2014

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

Risk Phrases

R12	Extremely Flammable.

Safety Phrases

S9	Keep container in a well ventilated place.
S16	Keep away from sources of ignition - No smoking.
S33	Take precautionary measures against static discharges.

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN Number	1954	**Transport Hazard Class**	2.1
Packing Group	None Allocated	**Hazchem Code**	2SE

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	CAS Number	EC Number	Content
ETHYL MERCAPTAN	75-08-1	200-837-3	<0.01%
HYDROGEN SULPHIDE	7783-06-4	231-977-3	<0.01%
METHANE	74-82-8	200-812-7	Remainder
NITROGEN	7727-37-9	231-783-9	<10%
ISOPROPYL MERCAPTAN	75-33-2	200-861-4	<0.01%
TERTIARY BUTYL MERCAPTAN	75-66-1	200-890-2	<0.01%

4. FIRST AID MEASURES

Eye Cold burns: Immediately flush with tepid water or with sterile saline solution. Hold eyelids apart and irrigate for 15 minutes. Seek medical attention.

Inhalation If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Be aware of possible explosive atmospheres. Apply artificial respiration if not breathing. Give oxygen if available. For advice, contact a Poison Information Centre

on 13 11 26 (Australia Wide) or a doctor.

Skin Cold burns: Remove contaminated clothing and gently flush affected areas with warm water (30°C) for 15 minutes. Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention.

Ingestion Due to product form and application, ingestion is considered unlikely.

Advice to doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability Highly flammable. May evolve toxic gases (carbon/ sulphur oxides, hydrocarbons) when heated to decomposition.

Fire and explosion Temperatures in a fire may cause cylinders to rupture and internal pressure relief devices to be activated. Cool cylinders or containers exposed to fire by applying water from a protected location. Do not approach cylinders or containers suspected of being hot. Remove cool cylinders from the path of the fire. Evacuate the area if unable to keep cylinders cool. If a flame from the cylinder is impinging on flammable materials or other cylinders then evacuate the area. If the cylinder is standing alone and the flame is not impinging on flammable materials or other cylinders then let the flame continue until all gas has been consumed. Ensure working area is well ventilated before re-entry. This material is capable of forming explosive mixtures in air.

Extinguishing Stop flow of gas if safe to do so, such as by slowly closing the cylinder valve.

Hazchem code 2SE

2 Water Fog (or fine water spray if fog unavailable)
S Self Contained Breathing apparatus and protective gloves.
E Evacuation of people in the vicinity of the incident should be considered.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. Eliminate all sources of ignition. Consider the risk of potentially explosive
atmospheres.

Environmental precautions Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

Methods of cleaning up Carefully move material to a well ventilated remote area, then allow to discharge if safe to do so. Do not attempt to repair leaking valve or cylinder safety devices.

References See Sections 8 and 13 for exposure controls and disposal.

7. STORAGE AND HANDLING

Storage Store cylinders securely, in separate area in an upright position in cool (<45°C), dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure cylinders are labelled, protected from physical damage and valves closed when not in use. Make use of old stock first (using a "first in-first out" inventory system), and do not store empty and full cylinders together.

Handling Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Do not drag, drop, slide or roll cylinders. The uncontrolled release of a gas under pressure may cause physical harm. Use a suitable hand truck for cylinder movement.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m³	ppm	mg/m³
Ethyl mercaptan	SWA (AUS)	0.5	1.3	--	--
Hydrogen sulfide	SWA (AUS)	10	14	15	21
Methane	SWA (AUS)	Asphyxiant			
Nitrogen	SWA (AUS)	Asphyxiant			

Biological limits No biological limit allocated.

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.

PPE

Eye / Face Wear safety glasses.

Hands Wear leather or insulated gloves.

Body Wear coveralls and safety boots.

Respiratory Where an inhalation risk exists, wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance COLOURLESS GAS
Odour DISAGREEABLE ODOUR
Flammability HIGHLY FLAMMABLE
Flash point NOT AVAILABLE
Boiling point NOT AVAILABLE
Melting point NOT AVAILABLE
Evaporation rate NOT APPLICABLE
pH NOT APPLICABLE
Vapour density NOT AVAILABLE
Specific gravity NOT APPLICABLE
Solubility (water) NOT AVAILABLE
Vapour pressure NOT AVAILABLE
Upper explosion limit NOT AVAILABLE
Lower explosion limit NOT AVAILABLE
Explosive properties NOT AVAILABLE
Oxidising properties NOT AVAILABLE
Cylinder pressure (when full) 11000 kPa @ 15°C
% Volatiles 100 %

10. STABILITY AND REACTIVITY

Chemical stability Stable under recommended conditions of storage.

Conditions to avoid Avoid heat, sparks, open flames and other ignition sources.

Material to avoid Incompatible with oxidising agents (e.g. hypochlorites), metals, metal oxides, alkalis (e.g. sodium hydroxide), lithium, ozone, titanium and lithium tetrahydroaluminate under specific conditions.

Hazardous Decomposition Products This material will not decompose to form hazardous products other than that already present.

Hazardous Reactions Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary

Asphyxiant. Symptoms of exposure are directly related to displacement of oxygen. As the amount of oxygen inhaled is reduced from 21-14% volume, the pulse rate may accelerate and the rate and volume of breathing may increase. The ability to maintain attention and think clearly is diminished, muscular co-ordination is somewhat disturbed. As oxygen decreases from 14-10% volume, judgement becomes faulty, severe injuries may result in no pain. Muscular effort may lead to rapid fatigue. Further reduction to 6% may result in nausea and vomiting. Ability to move may be lost. Permanent brain damage may result even after resuscitation from exposure to this low level of oxygen. Below 6% breathing is in gasps and convulsions may occur. Inhalation of a mixture containing no oxygen may result in unconsciousness from the first breath and death may follow in minutes. At 0.12 vppm to 30 vppm the odour is obvious and unpleasant. At 50 vppm marked dryness and irritation of the nose and throat occurs. Prolonged exposure may cause runny nose, cough, hoarseness, shortness of breath and pneumonia. At 100 to 150 vppm, there is a temporary loss of smell. At 200 to 250 vppm, severe irritation, headache, nausea, vomiting and dizziness occur. However, due to the low levels present, adverse health effects are greatly reduced.

Eye

Irritant. Contact may result in irritation, lacrimation, pain and redness. Contact with liquid or vapour may result in corneal burns and frostbite.

Inhalation

Irritant. When released into air the concentrations are diluted. Hydrogen sulphide has an unpleasant odour above 0.12 ppm but odour is not an adequate warning due to paralysis of sense of smell. At 200 to 250 ppm, hydrogen sulphide causes severe irritation as well as symptoms such as headache, nausea, vomiting and dizziness. High level exposure may result in systemic poisoning, particularly on the nervous system. Unconsciousness may follow, and this is very rapid at concentrations above 1000 ppm. High level exposure may result in paralysis of the respiratory centre.

Skin

Irritant. Contact may result in drying and defatting of the skin, rash and dermatitis.

Ingestion

Ingestion is considered unlikely due to product form.

Toxicity data

ETHYL MERCAPTAN (75-08-1)

LC50 (inhalation)	2770 ppm/4 hours (mouse)
LD50 (ingestion)	682 mg/kg (rat)
LD50 (intraperitoneal)	226 mg/kg (rat)

HYDROGEN SULPHIDE (7783-06-4)

LC50 (inhalation)	444 ppm (rat)

METHANE (74-82-8)

LC50 (inhalation)	326 gm/m3/2h (mouse)

TERTIARY BUTYL MERCAPTAN (75-66-1)

LC50 (inhalation)	16500 ppm/4 hours (mouse)
LD50 (ingestion)	4729 mg/kg (rat)
LD50 (intraperitoneal)	590 mg/kg (rat)
TCLo (inhalation)	201 ppm/6 hours/2 weeks - intermittently (rat)

12. ECOLOGICAL INFORMATION

Toxicity

No information provided.

Persistence and degradability

No information provided.

Bioaccumulative potential

No information provided.

Mobility in soil

No information provided.

Other adverse effects

Microorganisms in soil and water are involved in oxidation-reduction reactions which oxidise hydrogen sulphide to elemental sulphur. Not anticipated to bioaccumulate or concentrate in the food chain.

13. DISPOSAL CONSIDERATIONS

Waste disposal

Cylinders should be returned to the manufacturer or supplier for disposal of contents.

Legislation

Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN Number	1954	-	-
Proper Shipping Name	COMPRESSED GAS, FLAMMABLE, N.O.S.	-	-
Transport Hazard Class	2.1	-	-
Packing Group	None Allocated	-	-

Environmental hazards No information provided

Special precautions for user

Hazchem code 2SE

GTEPG 2A1

Other information Ensure cylinder is separated from driver and that outlet of relief device is not obstructed. Refer to Commonwealth, State and Territory Dangerous Goods Legislation which contain requirements which affect gas storage and transport.

15. REGULATORY INFORMATION

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Inventory Listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information The storage of significant quantities of gas cylinders must comply with AS4332 The storage and handling of gases in cylinders.

ASPHYXIANT GASES: Asphyxiant gases may displace oxygen leading to oxygen deficiency. Where oxygen content is low effects may include:
12-16% - increased breathing/ pulse rate, lack of coordination;
10-14% - mental disturbance, fatigue, breathing stress;
6-10% - vomiting, collapse and possible unconsciousness;
0-6% - convulsions, respiratory collapse and death.

ASPHYXIANTS (1): When present in the atmospheres in high concentrations, asphyxiants reduce the oxygen concentration by displacement. Atmospheres deficient in oxygen do not provide adequate sensory warning of danger and most simple asphyxiants are odourless. Therefore it is not appropriate to recommend an exposure standard for each asphyxiant, but to maintain oxygen concentrations. However, some asphyxiants may be given an exposure standard due to the potential for narcotic effects at high concentrations or an explosion hazard.

ASPHYXIANTS (2): There is a significant hazard associated with workers entering poorly ventilated areas (e.g. tanks) where oxygen may be deficient. An air supplied breathing apparatus may be required if adequate ventilation is not ensured.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
PEL	Permissible Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Revision history

Revision	Description
2.0	Included Risk Phrase.
1.0	Initial SDS creation

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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End of SDS