BOC
A Member of The Linde Group

SAFETY DATA SHEET

 # 2262

Product Name **4 COMPONENT MIXTURE (COS, C2H6S, CH4S, H2S, C2H6S, 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)
Web site	http://www.boc.com.au/
Synonym(s)	2262 - MSDS NUMBER • 6-COMPONENT SPECIAL GAS MIXTURE
Use(s)	CALIBRATION • INDUSTRIAL APPLICATIONS
SDS date	01 February 2013

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	**DG division**	2.1
Packing group	None Allocated	**Subsidiary risk(s)**	None Allocated
Hazchem code	2SE		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Identification	Classification	Content
CARBONYL SULPHIDE	CAS: 463-58-1 EC: 207-340-0	Not Available	0.004%
ETHYL MERCAPTAN	CAS: 75-08-1 EC: 200-837-3	F;R11 Xn;R20 N;R50/53	0.004%
METHYL MERCAPTAN	CAS: 74-93-1 EC: 200-822-1	T;R23 F+;R12 N;R50/53	0.004%
HYDROGEN SULPHIDE	CAS: 7783-06-4 EC: 231-977-3	T+;R26 N;R50 F+;R12	0.001%
METHANE	CAS: 74-82-8 EC: 200-812-7	F+;R12	Remainder
DIMETHYL SULPHIDE	CAS: 75-18-3 EC: 200-846-2	Not Available	0.004%

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing for 15 minutes.

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 Rinse exposed skin and/or hair with water.

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

Advice to doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability Very flammable. May evolve toxic gases (carbon oxides, sulphur oxides, hydrocarbons) when heated to decomposition. Oxidation reactions involving methyl mercaptan and/or ethyl mercaptan may produce toxic oxides of sulphur.

Fire and explosion May form explosive mixtures in air. Temperatures in a fire may cause cylinders to rupture and internal pressure relief devices to be activated. This product will add fuel to a fire. Cool cylinders exposed to fire by applying water from a protected location. Do not approach cylinders 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.

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 ignition sources. 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 heat or ignition sources, oxidising agents, alkalis, specific incompatibilities and foodstuffs. Ensure cylinders are labelled, protected from physical damage and valves closed when not in use. Make use of old stock first, do not store empty and full cylinders together.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Uncontrolled release of a gas under pressure may cause physical harm. The use of mechanical handling devices is recommended when moving large gas cylinders.

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			
Methyl mercaptan	SWA (AUS)	0.5	0.98	--	--

Biological limits No biological limit allocated.

Engineering controls Use with adequate ventilation. In poorly ventilated areas, mechanical extraction ventilation is recommended.

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 SLIGHT ROTTEN EGG ODOUR
Flammability HIGHLY FLAMMABLE
Flash point NOT APPLICABLE
Boiling point NOT RELEVANT
Melting point NOT RELEVANT
Evaporation rate NOT APPLICABLE
pH NOT APPLICABLE
Vapour density 0.6 (Air = 1)
Specific gravity NOT APPLICABLE
Solubility (water) INSOLUBLE
Vapour pressure NOT APPLICABLE
Upper explosion limit 15 % (Methane)
Lower explosion limit 5 % (Methane)
Autoignition temperature 537°C (Methane)
Decomposition temperature NOT AVAILABLE
Viscosity NOT AVAILABLE
Partition coefficient NOT AVAILABLE
% 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 (eg. hypochlorites), metals, metal oxides, alkalis (eg. hydroxides), lithium, ozone, titanium and lithium tetrahydroaluminate under specific conditions. Methyl and ethyl mercaptan react vigorously with oxidising agents. Forming SOx on contact with acid or acid fumes. Hydrogen sulphide can react violently with many substances. Corrosive when moist.

Hazardous Decomposition May evolve toxic gases (carbon oxides, sulphur oxides, hydrocarbons) when heated to

Products decomposition.

Hazardous Reactions Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Asphyxiant. Symptoms of exposure are directly related to displacement of oxygen from air. As the amount of oxygen inhaled is reduced from 21-14% volume, the pulse rate will accelerate and the rate and volume of breathing will 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 cause no pain. Muscular effort lead to rapid fatigue. Further reduction to 6% may cause 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 will follow in minutes. At 0.12 vppm to 30 vppm the odour of hydrogen sulphide is obvious and unpleasant.

Eye Irritant. Contact with liquid or vapour may result in corneal burns and frost-bite.

Inhalation Aspiration into the lungs may cause chemical pneumonitis which can be fatal.

Skin Irritant.

Ingestion Ingestion is considered unlikely due to product form.

Toxicity data

CARBONYL SULPHIDE (463-58-1)

LC50 (inhalation)	1070 ppm/4 hours (rat)
LD50 (intraperitoneal)	23 mg/kg (rat)
TCLo (inhalation)	162 ppm/6 hours/14 weeks intermittently (rat)

ETHYL MERCAPTAN (75-08-1)

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

METHYL MERCAPTAN (74-93-1)

LC50 (inhalation)	675 ppm (rat)
TCLo (inhalation)	17 ppm/7 hours/13 weeks intermittently (rat)

HYDROGEN SULPHIDE (7783-06-4)

LC50 (inhalation)	444 ppm (rat)

METHANE (74-82-8)

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

DIMETHYL SULPHIDE (75-18-3)

LC50 (inhalation)	31.62 mg/m^3 (mouse)
LD50 (ingestion)	3300 mg/kg (rat)
LD50 (intraperitoneal)	8000 mg/kg (mouse)
LD50 (skin)	5000 mg/kg (rabbit)
TDLo (ingestion)	3412 mg/kg/33 weeks intermittently (rabbit)

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 Residence time for hydrogen sulphide in the atmosphere ranges from about one day to more than 40 days, depending upon season, latitude and atmospheric conditions. Not anticipated to bioaccumulate or concentrate in the food chain. When discharged into the atmosphere, methane may contribute to the greenhouse effect. Methane has a global warming potential of 21 (CO2 = 1).

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.	-	-
DG class/ Division	2.1	-	-
Subsidiary risk(s)	None Allocated	-	-
Packing group	None Allocated	-	-
GTEPG	2A1		

Hazchem code 2SE

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% oxygen: 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. Application Method: Gas regulator of suitable pressure and flow rating fitted to cylinder valve or manifold with low pressure gas distribution to equipment.

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 (eg. 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
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m³	Milligrams per Cubic Metre
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
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
TLV	Threshold Limit Value
TWA/OEL	Time Weighted Average or Occupational Exposure Limit

Revision history

Revision	Description
2.0	Standard SDS Review.
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