

SAFETY DATA SHEET

1897

Product Name **6 COMPONENT MIXTURE (COS, C₂H₆S, CH₄S, H₂S, C₂H₆S₂, BALANCE H₂)**

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) 1897 - MSDS NUMBER • PRODUCT CODE: 292 • SPECIAL GAS MIXTURE
Use(s) CALIBRATION • INDUSTRIAL APPLICATIONS
SDS date 31 May 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	<0.0005%
DIMETHYL DISULPHIDE	CAS: 624-92-0 EC: 210-871-0	Xi;R36/38	<0.0005%
ETHYL MERCAPTAN	CAS: 75-08-1 EC: 200-837-3	F;R11 Xn;R20 N;R50/53	<0.0005%
HYDROGEN SULPHIDE	CAS: 7783-06-4 EC: 231-977-3	T+;R26 N;R50 F+;R12	<0.0005%
METHYL MERCAPTAN	CAS: 74-93-1 EC: 200-822-1	T;R23 F+;R12 N;R50/53	<0.0005%
HYDROGEN	CAS: 1333-74-0 EC: 215-605-7	F+;R12	Remainder

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 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	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/m ³	ppm	mg/m ³
Ethyl mercaptan	SWA (AUS)	0.5	1.3	--	--
Hydrogen	SWA (AUS)	Asphyxiant			
Hydrogen sulfide	SWA (AUS)	10	14	15	21
Methyl mercaptan	SWA (AUS)	0.5	0.98	--	--

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 OR LIQUID
Odour	ROTTEN EGG 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)	2.3 L/L (Hydrogen sulphide)
Vapour pressure	NOT AVAILABLE
Upper explosion limit	75 % (Hydrogen)
Lower explosion limit	4 % (Hydrogen)
Autoignition temperature	560°C (Hydrogen)
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.
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 frost-bite.																								
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	CARBONYL SULPHIDE (463-58-1) <table><tr><td>LC50 (inhalation)</td><td>1070 ppm/4 hours (rat)</td></tr><tr><td>LD50 (intraperitoneal)</td><td>23 mg/kg (rat)</td></tr><tr><td>TCLo (inhalation)</td><td>162 ppm/6 hours/14 weeks intermittently (rat)</td></tr></table> DIMETHYL DISULPHIDE (624-92-0) <table><tr><td>LC50 (inhalation)</td><td>12.3 mg/m³/2 hours (mouse)</td></tr><tr><td>TCLo (inhalation)</td><td>250 ppm/6 hour/13 days-intermittent (rat)</td></tr><tr><td>TDLo (skin)</td><td>2126 mg/kg/4 weeks-intermittent (rabbit)</td></tr></table> ETHYL MERCAPTAN (75-08-1) <table><tr><td>LC50 (inhalation)</td><td>2770 ppm/4 hours (mouse)</td></tr><tr><td>LD50 (ingestion)</td><td>682 mg/kg (rat)</td></tr><tr><td>LD50 (intraperitoneal)</td><td>226 mg/kg (rat)</td></tr></table> HYDROGEN SULPHIDE (7783-06-4) <table><tr><td>LC50 (inhalation)</td><td>444 ppm (rat)</td></tr></table> METHYL MERCAPTAN (74-93-1) <table><tr><td>LC50 (inhalation)</td><td>675 ppm (rat)</td></tr><tr><td>TCLo (inhalation)</td><td>17 ppm/7 hours/13 weeks intermittently (rat)</td></tr></table>	LC50 (inhalation)	1070 ppm/4 hours (rat)	LD50 (intraperitoneal)	23 mg/kg (rat)	TCLo (inhalation)	162 ppm/6 hours/14 weeks intermittently (rat)	LC50 (inhalation)	12.3 mg/m ³ /2 hours (mouse)	TCLo (inhalation)	250 ppm/6 hour/13 days-intermittent (rat)	TDLo (skin)	2126 mg/kg/4 weeks-intermittent (rabbit)	LC50 (inhalation)	2770 ppm/4 hours (mouse)	LD50 (ingestion)	682 mg/kg (rat)	LD50 (intraperitoneal)	226 mg/kg (rat)	LC50 (inhalation)	444 ppm (rat)	LC50 (inhalation)	675 ppm (rat)	TCLo (inhalation)	17 ppm/7 hours/13 weeks intermittently (rat)
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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.
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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	1954	1954
Proper shipping name	COMPRESSED GAS, FLAMMABLE, N.O.S.		
DG class/ Division	2.1	2.1	2.1
Subsidiary risk(s)	None Allocated	None Allocated	None Allocated
Packing group	None Allocated	None Allocated	None Allocated
GTEPG	2A1		
Hazchem code	2SE		
EMS	F-D, S-U		
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	Classified as a Schedule 7 (S7) 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. APPLICATION METHOD: Gas regulator of suitable pressure and flow rating fitted to cylinder or manifold with low pressure gas distribution to equipment. ASPHYXIAN 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. 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.
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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/m ³	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