

## SAFETY DATA SHEET

# 2310

Product Name **CARBON DIOXIDE AND HYDROGEN SULPHIDE IN METHANE**

### 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  
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**Emergency** 1800 653 572 (24/7) (Australia only)  
**Web site** <http://www.boc.com.au/>  
**Synonym(s)** 2310 - MSDS NUMBER • 292-1033 - PRODUCT CODE • SPECIAL GAS MIXTURE  
**Use(s)** CALIBRATION  
**SDS date** 08 January 2014

### 2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

#### RISK PHRASES

R12 Extremely Flammable.  
R26 Very toxic by inhalation.

#### SAFETY PHRASES

S1/2 Keep locked up and out of reach of children.  
S9 Keep container in a well ventilated place.  
S16 Keep away from sources of ignition - No smoking.  
S36 Wear suitable protective clothing.  
S38 In case of insufficient ventilation, wear suitable respiratory equipment.  
S45 In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).  
S61 Avoid release to the environment. Refer to special instructions/safety data sheets.

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

|                      |                |                           |                |
|----------------------|----------------|---------------------------|----------------|
| <b>UN number</b>     | 1954           | <b>DG division</b>        | 2.1            |
| <b>Packing group</b> | None Allocated | <b>Subsidiary risk(s)</b> | None Allocated |
| <b>Hazchem code</b>  | 2SE            |                           |                |

### 3. COMPOSITION/ INFORMATION ON INGREDIENTS

| Ingredient        | Identification                  | Classification      | Content   |
|-------------------|---------------------------------|---------------------|-----------|
| HYDROGEN SULPHIDE | CAS: 7783-06-4<br>EC: 231-977-3 | F+;R12 T+;R26 N;R50 | 1 to 5%   |
| METHANE           | CAS: 74-82-8<br>EC: 200-812-7   | F+;R12              | Remainder |
| CARBON DIOXIDE    | CAS: 124-38-9<br>EC: 204-696-9  | Not Available       | 30%       |

## 4. FIRST AID MEASURES

|                         |                                                                                                                                                                                                                                                                 |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Eye</b>              | If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.                                                                        |
| <b>Inhalation</b>       | If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Apply artificial respiration if not breathing. Give oxygen if breathing is difficult. Seek immediate medical attention. |
| <b>Skin</b>             | If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water.                                                                                                                                                        |
| <b>Ingestion</b>        | Ingestion is not considered a potential route of exposure.                                                                                                                                                                                                      |
| <b>Advice to doctor</b> | If inhalation has occurred observe for premonitory signs of pulmonary oedema. Otherwise, treatment is symptomatic and supportive. Treat for cold burns if severe liquid contact.                                                                                |

## 5. FIRE FIGHTING MEASURES

|                           |                                                                                                                                                                                                                                                                                                                                              |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Flammability</b>       | Highly flammable gas - potentially explosive. May evolve toxic gases (sulphur oxides) when heated to decomposition. Do not expose to heat and ignition sources. Eliminate ignition sources including cigarettes, open flames, electrical equipment, spark producing switches/ tools, naked lights, heaters, pilot lights, etc when handling. |
| <b>Fire and explosion</b> | 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. This material is capable of forming explosive mixtures in air.         |
| <b>Extinguishing</b>      | Stop flow of gas if safe to do so, such as by slowly closing the cylinder valve.                                                                                                                                                                                                                                                             |
| <b>Hazchem code</b>       | 2SE<br><div style="margin-left: 20px;"> 2      Water Fog (or fine water spray if fog unavailable)<br/> S      Self Contained Breathing apparatus and protective gloves.<br/> E      Evacuation of people in the vicinity of the incident should be considered. </div>                                                                        |

## 6. ACCIDENTAL RELEASE MEASURES

|                                  |                                                                                                                                                                                                                                                                                                                       |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Personal precautions</b>      | 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. |
| <b>Environmental precautions</b> | Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.                                                                                                                                                                                                           |
| <b>Methods of cleaning up</b>    | 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.                                                                                                                                                |
| <b>References</b>                | See Sections 8 and 13 for exposure controls and disposal.                                                                                                                                                                                                                                                             |

## 7. STORAGE AND HANDLING

|                 |                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Storage</b>  | Do not store near incompatible substances and sources of ignition. Replace outlet seals after use. Cylinders should be stored: upright, prevented from falling, in a secure area; below 45°C, in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits. |
| <b>Handling</b> | 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 <sup>3</sup> | ppm   | mg/m <sup>3</sup> |
| Carbon dioxide               | SWA (AUS) | 5000       | 9000              | 30000 | 54000             |
| Carbon dioxide in coal mines | SWA (AUS) | 12500      | 22500             | 30000 | 54000             |
| Hydrogen sulfide             | SWA (AUS) | 10         | 14                | 15    | 21                |
| Methane                      | SWA (AUS) | Asphyxiant |                   |       |                   |

**Biological limits**

No biological limit allocated.

**Engineering controls**

Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical explosion proof extraction ventilation is recommended. Flammable or explosive vapours may accumulate in confined or poorly ventilated areas. Vapours may travel some distance to an ignition source and flash back. Maintain atmospheric levels below the recommended exposure standard.

**PPE****Eye / Face**

Wear safety glasses.

**Hands**

Wear rubber gloves.

**Body**

Wear safety boots.

**Respiratory**

Wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

|                           |                  |
|---------------------------|------------------|
| Appearance                | COLOURLESS GAS   |
| Odour                     | ROTTEN EGG ODOUR |
| Flammability              | HIGHLY FLAMMABLE |
| Flash point               | NOT RELEVANT     |
| Boiling point             | NOT RELEVANT     |
| Melting point             | NOT RELEVANT     |
| Evaporation rate          | NOT APPLICABLE   |
| pH                        | NOT APPLICABLE   |
| Vapour density            | NOT AVAILABLE    |
| Specific gravity          | NOT APPLICABLE   |
| Solubility (water)        | SLIGHTLY SOLUBLE |
| Vapour pressure           | NOT AVAILABLE    |
| Upper explosion limit     | 15 % (methane)   |
| Lower explosion limit     | 5 % (methane)    |
| Partition coefficient     | NOT AVAILABLE    |
| Autoignition temperature  | NOT AVAILABLE    |
| Decomposition temperature | NOT AVAILABLE    |
| Viscosity                 | NOT AVAILABLE    |
| Explosive properties      | NOT AVAILABLE    |
| Oxidising properties      | 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, nitrogen trichloride, alkalis (eg. sodium hydroxide), heat and ignition sources.

**Hazardous Decomposition Products**

May evolve toxic gases (sulphur oxides) when heated to decomposition.

Hazardous Reactions Polymerization will not occur.

## 11. TOXICOLOGICAL INFORMATION

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Health Hazard Summary</b> | Very toxic by inhalation - severe irritant. Over exposure to hydrogen sulphide may result in headache, nausea, vomiting, diarrhea, vertigo, amnesia, dizziness, apnea, palpitations, tachycardia, hypotension, muscle cramps, weakness, disorientation, and coma. Higher concentrations may also result in result in respiratory paralysis, asphyxial seizures, and death. Cold burns may be caused by evaporating liquid. Persons with potential exposure should not wear contact lenses. Carbon dioxide concentrations of 3-5 % in air cause increased respiration and headache. Concentrations of 8-15% cause headache, nausea and vomiting which may lead to unconsciousness if not moved to open air and given oxygen. Inhalation of a mixture containing no oxygen may result in unconsciousness from the first breath and death may follow in minutes. |
| <b>Eye</b>                   | Severe irritant. Inflammation and irritation can occur at concentrations below 10 vppm. Above 50 vppm, there is intense tearing, blurring of vision and photophobia. Most symptoms disappear when exposure ceases, however in serious cases permanent eye damage can occur. Cold burns may be caused by evaporating liquid. Persons with potential exposure should not wear contact lenses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Inhalation</b>            | Very toxic by inhalation - severe irritant. Exposure to concentrations approaching 250 ppm causes irritation of mucus membranes, conjunctivitis, photophobia, lacrimation, corneal opacity, rhinitis, bronchitis, cyanosis, and acute lung injury. At concentrations of 250 ppm to 500 ppm, signs and symptoms include headache, nausea, vomiting, diarrhea, vertigo, amnesia, dizziness, apnea, palpitations, tachycardia, hypotension, muscle cramps, weakness, disorientation, and coma. At concentrations of 750 ppm to 1000 ppm, victims may experience abrupt physical collapse or "knock down". Higher concentrations may also result in result in respiratory paralysis, asphyxial seizures, and death.                                                                                                                                               |
| <b>Skin</b>                  | Irritant. Over exposure to hydrogen sulphide may result in pain, and erythema, especially in moist areas. Cyanosis may be noted following severe exposure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Ingestion</b>             | Ingestion is considered unlikely due to product form. However, ingestion of liquid may result in burns to the mouth and throat.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Toxicity data</b>         | <p>HYDROGEN SULPHIDE (7783-06-4)</p> <p>LC50 (inhalation) 444 ppm (rat)</p> <p>METHANE (74-82-8)</p> <p>LC50 (inhalation) 326 gm/m3/2h (mouse)</p> <p>CARBON DIOXIDE (124-38-9)</p> <p>LC50 (inhalation) 470000 ppm/30M (rat)</p> <p>LCLo (inhalation) 9 pph/5M (human)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## 12. ECOLOGICAL INFORMATION

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Toxicity</b>                      | No information provided.                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Persistence and degradability</b> | No information provided.                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Bioaccumulative potential</b>     | No information provided.                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Mobility in soil</b>              | No information provided.                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Other adverse effects</b>         | 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. Very toxic to aquatic organisms. when discharged into the atmosphere, methane and carbon dioxide may contribute to the greenhouse effect. Methane has a global warming potential of 21 (CO <sub>2</sub> = 1). |

## 13. DISPOSAL CONSIDERATIONS

|                       |                                                                                                                                           |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Waste disposal</b> | Return to manufacturer for recycling/ reuse. Contact Waste Disposal Authorities in your state for further details and required approvals. |
| <b>Legislation</b>    | 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<br>(ADG)                                                                                                                                                                            | SEA TRANSPORT<br>(IMDG / IMO) | AIR TRANSPORT<br>(IATA / ICAO) |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------|
| UN number            | 1954                                                                                                                                                                                               | -                             | -                              |
| Proper shipping name | COMPRESSED GAS,<br>FLAMMABLE, N.O.S. (contains<br>Methane)                                                                                                                                         | -                             | -                              |
| 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 foodstuffs. 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) | <b>AUSTRALIA: AICS (Australian Inventory of Chemical Substances)</b><br>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 withdrawal: regulator of suitable pressure and flow rating fitted to cylinder or manifold with low pressure gas distribution to equipment.

### 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/m <sup>3</sup> | 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      | 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**