

## Safety Data Sheet 2-METHYLPROPAN-2-OL

SDS no. 4UVNML8X • Version 1.0 • Date of issue: 2023-01-28

### SECTION 1: Identification

#### GHS Product identifier

Product name 2-METHYLPROPAN-2-OL

#### Recommended use of the chemical and restrictions on use

Used in the manufacture of isobutylene (which is used to manufacture methyl t-butyl ether (MTBE), an octane improver in unleaded gasoline), and methyl methacrylate; in organic synthesis to introduce the tert-butyl group into organic compounds; and in the preparation of glycol ethers; solvent in the manufacture of pharmaceuticals, perfumes, flavours, paint removers, flotation agents, plastics, lacquers, oil-soluble polyester resins; for the removal of water from substances; starting material for the preparation of organic peroxides; component of industrial cleaning compounds and insecticidal formulations; defoaming agent; stabilizer in chlorinated hydrocarbons; denaturant for ethanol and laboratory reagent.

#### Supplier's details

Name	ChemSupply Australia Pty Ltd
Address	38-50 Bedford Street 5013 Gillman South Australia Australia
Telephone	08 8440 2000
email	www.chemsupply.com

#### Emergency phone number

CHEMCALL 1800 127 406 (Australia) / +64-4-917-9888 (International)

### SECTION 2: Hazard identification

#### General hazard statement

Classified as dangerous goods according to the Australian Dangerous Goods Code (ADG).

Classified as Hazardous according to the Globally Harmonised System of classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia.

#### Classification of the substance or mixture

#### GHS classification in accordance with: UN GHS revision 7

- Acute toxicity, inhalation, Cat. 4
- Serious eye damage/eye irritation, Cat. 2A
- Flammable liquids, Cat. 2

# Safety Data Sheet

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- Specific target organ toxicity following single exposure, Cat. 3

### GHS label elements, including precautionary statements

#### Pictograms



#### Signal word

**Danger**

#### Hazard statement(s)

H225	Highly flammable liquid and vapor
H319	Causes serious eye irritation
H332	Harmful if inhaled
H335	May cause respiratory irritation
H336	May cause drowsiness or dizziness

#### Precautionary statement(s)

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233	Keep container tightly closed.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242	Use non-sparking tools.
P243	Take action to prevent static discharges.
P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P264	Wash hands thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a POISON CENTER/doctor/physician if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.
P370+P378	In case of fire: Use foam/dry chemical to extinguish.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal facility

## SECTION 3: Composition/information on ingredients

#### Mixtures

Molecular weight: 74.12

#### Components

Component	Concentration
T-BUTYL ALCOHOL (CAS no.: 75-65-0; EC no.: 200-889-7; Index no.: 603-005-00-1)	100 % (weight)

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CLASSIFICATIONS: Flammable liquids, Cat. 2; Acute toxicity, inhalation, Cat. 4; Specific target organ toxicity following single exposure, Cat. 3; Serious eye damage/eye irritation, Cat. 2A. HAZARDS: H225 - Highly flammable liquid and vapor; H319 - Causes serious eye irritation; H332 - Harmful if inhaled; H335 - May cause respiratory irritation.

### SECTION 4: First-aid measures

#### Description of necessary first-aid measures

General advice	For advice, contact a Poisons Information Centre (e.g. phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor (at once).
If inhaled	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.
In case of skin contact	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water.
In case of eye contact	If in eyes, hold eyelids apart and flush eye continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre (e.g. phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor, or for at least 15 minutes.
If swallowed	If swallowed, do NOT induce vomiting.

#### Most important symptoms/effects, acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

#### Indication of immediate medical attention and special treatment needed, if necessary

For advice in an emergency, contact a Poisons Information Centre (Phone Australia 131 126) or a doctor at once.

### SECTION 5: Fire-fighting measures

#### Suitable extinguishing media

Caution: Use of water spray when fighting fire may be inefficient.

Small fire: Use foam, dry chemical, CO<sub>2</sub> or water spray.

Large fire: Use foam, fog or water spray - Do not use water jets.

If safe to do so, move undamaged containers from fire area. Cool containers with flooding quantities of water until well after fire is out.

Avoid getting water inside containers.

#### Specific hazards arising from the chemical

Toxic fumes and gases, including carbon monoxide and flammable isobutylene gas and irritating gases, which may include unburned alcohol and toxic constituents. Formation of peroxides possible. Butanol reacts strongly with strong oxidizing agents, alkali metals, and strong mineral acids and may then give rise to a combustible gas (hydrogen).

**HIGHLY FLAMMABLE:** These liquids have a low flashpoint - Will be easily ignited by heat, sparks or flame. Vapours will form explosive mixtures with air. Vapours may travel to source of ignition and flash back. Vapours is heavier than air and will collect in low or confined areas (drains, basements, tanks). Liquids is lighter than water. Containers may explode when heated. Fire will produce irritating, poisonous and/or corrosive gases. Vapours from runoff may create explosion hazard.

#### Special protective actions for fire-fighters

Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA) operated in positive pressure mode. Fight fire from safe location.

### SECTION 6: Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. For personal protection see section 8.

**Methods and materials for containment and cleaning up**

ELIMINATE all ignition sources (no smoking, flares, sparks or flame) within at least 50m - All equipment used when handling the product must be earthed. Do not touch or walk through spilled material. Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas. Vapour-suppressing foam may be used to control vapours - Water spray may be used to knock down or divert vapour clouds. Absorb with earth, sand or other non-combustible material. Use clean, non-sparking tools to collect absorbed material and place it into loosely-covered metal or plastic containers for later disposal. SEEK EXPERT ADVICE ON HANDLING AND DISPOSAL.

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**SECTION 7: Handling and storage**

**Precautions for safe handling**

Avoid ingestion and inhalation of gas/fumes/vapour or spray mist. Avoid contact with eyes, skin, and clothing. Keep locked up. Keep container closed. Use only with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Wear suitable protective clothing. Wash thoroughly after handling. Always wash hands before smoking, eating, drinking or using the toilet. Keep away from incompatibles such as oxidizing agents, acids. Remove contaminated clothing and wash before reuse. Keep away from heat and all sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge. Ground all equipment containing material. Ground and bond containers when transferring material. All electrical equipment must be flameproofed. Use spark-proof tools and explosion proof equipment and lighting. Empty containers retain product residue, (liquid and/or vapour), and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Do NOT use compressed air for filling, discharging, or handling.

**Conditions for safe storage, including any incompatibilities**

Store in a segregated, fireproof and approved flammables-area. Store in tightly closed containers, in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Store small containers in suitable flammable liquid storage cabinets when not in use. Larger drums (200l) must be kept in purpose-built stores. Outside or detached storage is preferred. Store away from incompatible substances. Separate from strong acids, oxidizing agents and alkali metals. Protect against physical damage, direct sunlight and moisture. Store away from sources of heat. Avoid all possible sources of ignition (spark or flame). Storage and use areas should be No Smoking areas. Containers should be bonded and grounded for transfers to avoid static sparks. Use non-sparking type tools and equipment, including explosion proof ventilation. Product may solidify at room temperature. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Containers of this material may be hazardous when empty since they retain product residues (vapours, liquid); observe all warnings and precautions listed for the product.

Corrosivity to Metals: tert-Butanol is not corrosive to the common metals. Stainless steels (types 304/347, 316 and 20 Cb 3), high silicon iron, aluminium, copper, brass, bronze, naval bronze, nickel and its alloys, Hastelloy, Inconel, Monel, tantalum, titanium and zirconium have good resistance (penetration less than 20 mm (505 µm)/year).

Corrosivity to Non-Metals: tert-Butanol can attack some plastics (such as Acrylonitrile-Butadiene-Styrene (ABS), Styrene-Acrylonitrile, and polyvinyl chloride (PVC) (above 32 °C), elastomers (such as FKM (Viton A), and polyether-urethane) and coatings.

Refer Australian Standard AS 1940-2017 The storage and handling of flammable and combustible liquids

Unsuitable Materials: Some plastics (such as Acrylonitrile-Butadiene-Styrene (ABS), Styrene-Acrylonitrile, and polyvinyl chloride (PVC) (above 32 °C), elastomers (such as FKM (Viton A), and polyether-urethane) and coatings.

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**SECTION 8: Exposure controls/personal protection**

**Appropriate engineering controls**

Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, gas, etc.) below recommended exposure limits.

**Individual protection measures, such as personal protective equipment (PPE)**

**Eye/face protection**

The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.

**Skin protection**

Clean impervious clothing should be worn. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Hand Protection: Normally not required but if in doubt ensure hand protection should comply with AS 2161, Occupational protective gloves - Selection, use and maintenance.

**Body protection**

Suitable protective workwear, e.g. cotton overalls buttoned at neck and wrist is recommended. Chemical resistant apron is recommended where large quantities are handled.

**Respiratory protection**

If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable vapor/ mist filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements. Reference should be made to Australian Standards AS/ NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

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**SECTION 9: Physical and chemical properties**

**Basic physical and chemical properties**

Physical state	Liquid
Appearance	Colourless liquid; colourless or white hygroscopic, rhombic crystals below melting point.
Color	No data available.
Odor	Camphor-like odour.
Odor threshold	approximately 144.7 mg/m <sup>3</sup> (47 ppm). Reported values vary widely; 3.3-957 ppm; acceptable value: 957 ppm (detection). Warning Properties: POOR - reported odour threshold values vary widely; acceptable value is ten times the TLV.
Melting point/freezing point	24-26 °C.
Boiling point or initial boiling point and boiling range	82-83 °C.
Flammability	No data available.
Lower and upper explosion limit/flammability limit	Lower: 2.4 vol% [1K] Flammable Limits - Upper: 8.0 vol%
Flash point	11 °C (Closed Cup).
Explosive properties	Can release vapours that readily form explosive mixtures with air at, or above, 11 °C. Vapours can accumulate in confined spaces, resulting in an explosion and toxicity hazard. Closed containers may rupture violently and suddenly release large amounts of product when exposed to fire or excessive heat for a sufficient period of time. Vapours can flow along surfaces to distant ignition source and flash back.
Auto-ignition temperature	478 °C.
Decomposition temperature	No data available.
Oxidizing properties	No data available.
pH	Probably neutral.

## Safety Data Sheet

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Kinematic viscosity

Saybolt Universal Viscosity: 44.0 Saybolt Universal Seconds at 37.8 °C (calculated). [87] Kinematic Viscosity: 5.52 mm<sup>2</sup>/s (5.52 centistokes) at 25 °C (calculated). [88] Dynamic Viscosity: 4.31 mPa.s (4.31 centipoises) at 25 °C; 3.35 mPa.s (3.35 centipoises) at 30 °C.

Solubility

Solubility in Water: Miscible (soluble) in all proportions. [13] Solubility in Organic Solvents: Miscible in alcohols (e.g. ethanol), ethers (e.g. diethyl ether), ketones, esters and aromatic and aliphatic hydrocarbons.

Partition coefficient n-octanol/water (log value)

log Pow: 0.3; log Pow: 0.35; log Pow: 0.47 (calculated).

Vapor pressure

4 kPa (30.1 mm Hg) at 20 °C; 5.56-5.6 kPa (41.7-42 mm Hg) at 25 °C.

Evaporation rate

1.05 (n-butyl acetate = 1).

Density and/or relative density

Specific Gravity: 0.78 @ 25 °C

Relative vapor density

2.55 (air = 1).

#### Particle characteristics

No data available.

#### Supplemental information regarding physical hazard classes

[AN] Surface Tension: 19.96 mN/m (19.96 dynes/cm) at 25 °C; 19.1 mN/m (19.1 dynes/cm) at 30 °C.

#### Further safety characteristics (supplemental)

Saturated Vapour Concentration: 39600 ppm (3.96%) at 20 °C; 54900 to 55300 ppm (5.49 to 5.53%) at 25 °C (calculated).

Other Information: Dielectric Constant: 12.47 at 25 °C (38); 10.9 at 30 °C (31)

Dissociation Constants: pKa = 19.20

Heat of Vaporization: 39.07 kJ/mol

Refractive Index: 1.38468 @ 20 °C/D; 1.38231 @ 25 °C/D

Henry's Law Constant: 1.214 Pa.m<sup>3</sup>/mol (1.2 x 10<sup>-5</sup> atm.m<sup>3</sup>/mol) (cited as log H = -3.31 (dimensionless)) at 25 °C (experimental).

Hydroxyl radical reaction rate constant = 1.12 x 10<sup>-12</sup> cu cm/molecule-sec @ 25 °C.

Conversion factors: 1 mg/m<sup>3</sup> = 0.324 ppm; 1 ppm = 3.082 mg/m<sup>3</sup>.

Critical Temperature: 232.9 °C (451.2 °F)

Relative density of the vapour/air-mixture at 20 °C (air = 1): 1.06.

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## SECTION 10: Stability and reactivity

#### Reactivity

Reacts with incompatible materials

Stable under normal conditions of storage and handling.

#### Chemical stability

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Peroxides may be formed.

#### Possibility of hazardous reactions

Reaction with strong oxidizing agents (e.g. calcium hypochlorite, chlorine oxides, chromium trioxide, hydrogen peroxide and other peroxides, nitric acid and nitrates, or permanganates) may be violent or explosive, with an increased risk of fire and explosion. Contact with potassium-sodium alloy can caused ignition. Reaction with alkali metals (e.g. sodium or potassium) and alkaline-earth metals (e.g. calcium or magnesium) gives off flammable hydrogen gas. Reaction with strong mineral acids can cause decomposition to flammable isobutylene gas. Mixture with hydrogen peroxide and sulfuric acid can result in severe explosions.

**Conditions to avoid**

High temperatures, heat, static discharge, friction, sparks, open flames, other ignition sources and incompatible materials.

**Incompatible materials**

Strong oxidizing agents (e.g. calcium hypochlorite, chlorine oxides, chromium trioxide, hydrogen peroxide and other peroxides, nitric acid and nitrates, or permanganates), potassium-sodium alloy, alkali metals (e.g. sodium or potassium), alkaline-earth metals (e.g. calcium or magnesium), aluminium, strong mineral acids, hydrogen peroxide and sulfuric acid.

**Hazardous decomposition products**

Toxic fumes and gases, including carbon monoxide and flammable isobutylene gas and irritating gases, which may include unburned alcohol and toxic constituents. Formation of peroxides possible.

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**SECTION 11: Toxicological information**

**Information on toxicological effects**

**Acute toxicity**

Oral: LD50 (rat): 2743 mg/kg, Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Eye: Lacrimation. Respiratory disorder. Gastrointestinal: Other changes;

Inhalation: LC50 (rat): 4 h - > 10000 ppm, Remarks: Behavioural: Ataxia. Lungs, Thorax, or Respiration: Dyspnea. Lungs, Thorax, or Respiration: Pulmonary emboli.

Ingestion: Slightly harmful if swallowed with symptoms similar to those for inhalation. Ingestion of a large amount is likely to produce symptoms of central nervous system (CNS) depression such as headache, dizziness, drowsiness, and unconsciousness. The potency for intoxication is approximately 1.5 times that of ethanol. There is a risk of aspiration into the lungs, if ingested or vomited. Aspiration may result in severe lung damage (pulmonary oedema) and, in some cases, respiratory failure and death. Ingestion is not a typical route of occupational exposure.

Inhalation: Harmful if inhaled. Vapour may irritate the mucous membranes of the nose, throat and respiratory tract. Inhalation of vapour can result in headaches, dizziness and possible nausea. tert-Butanol is a mild central nervous system (CNS) depressant. Inhalation of high concentrations can produce central nervous system depression, which can lead to headache, dizziness, drowsiness, confusion, loss of co-ordination, impaired judgment and, if exposure is prolonged, unconsciousness. No minimum concentrations at which these effects occur have been reported. However, exposure to concentrations less than 100 ppm is not likely to produce these effects.

// ----- From the Suggestion report (30/01/2023, 5:53 PM) ----- //

The ATE (gas inhalation) of the mixture is: 4500 ppmV

**Skin corrosion/irritation**

Dermal: LD50 (rabbit): > 2000 mg/kg, Remarks: Prolonged skin contact may cause skin irritation and/or dermatitis.

Contact with skin may result in no or very mild irritation. May cause dermatitis. May cause an allergic skin reaction in sensitive persons.

Skin, rabbit, 24 h, Result: Mild skin irritation.

**Serious eye damage/irritation**

Vapour may cause eye irritation. Exposure to the liquid or crystals is likely to cause moderate irritation and may cause conjunctivitis of the eye.

Eyes, rabbit, 24 h, Result: Severe eye irritation.

**Respiratory or skin sensitization**

Guinea pig maximization test: not sensitizing.

Not expected to be a respiratory or skin sensitiser.

**Germ cell mutagenicity**

Not considered to be a mutagenic hazard.

**Carcinogenicity**

Not considered to be a carcinogenic hazard.

**Reproductive toxicity**

Suspected Developmental Toxicant (Jankovic, J. A Screening Method for Occupational Reproductive Health Risk. American Industrial Hygiene Association Journal. 57: 641-649. 1996).

**Specific target organ toxicity (STOT) - single exposure**

May cause respiratory irritation. - Respiratory Tract  
May cause drowsiness or dizziness. - Central nervous system

**Specific target organ toxicity (STOT) - repeated exposure**

Not expected to cause toxicity to a specific target organ.

**Aspiration hazard**

Not expected to be an aspiration hazard.

**Additional information**

Chronic Effects: Repeated or prolonged skin contact may cause drying, reddening and cracking of the skin (dermatitis).

Toxicologically Synergistic Materials: Alcohols may interact synergistically with chlorinated solvents (e.g. carbon tetrachloride), aromatic hydrocarbons (e.g. xylene) or dithiocarbamates (e.g. disulfiram).

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**SECTION 12: Ecological information**

**Toxicity**

Biological Properties: Miscible with water.

Acute Toxicity - Fish: Pimephales promelas LC50: 6140 mg/l /96 h; Carassius auratus LC50: > 5000 mg/l /24 h.

Acute Toxicity - Daphnia: Daphnia magna EC50: 933 mg/l /48 h.

**Persistence and degradability**

Abiotic degradation: water: Slow degradation.

Biologic degradation: Biodegradation: > 99.9 % /19 d (OECD 302 B); Easily eliminable.

COD: 2.49 g/g; COD 80 % von ThOD.

**Bioaccumulative potential**

No bioaccumulation is to be expected (log P(o/w) <1).

**Mobility in soil**

Distribution: log P(o/w): 0.30 (OECD 107).

**Results of PBT and vPvB assessment**

No data available.

**Endocrine disrupting properties**



No data available.

**Other adverse effects**

No data available.

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**SECTION 13: Disposal considerations**

**Disposal methods**

**Product disposal**

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers.

**Sewage disposal**

No bioaccumulation is to be expected (log P(o/w) <1).

**Other disposal recommendations**

Do not discharge this material into waterways, drains and sewers.

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**SECTION 14: Transport information**

**ADG (Road and Rail)**

UN Number: 1120

Class: 3

Packing Group: II

Proper Shipping Name: BUTANOLS

**Hazchem emergency action code (EAC)**

•2YE

**IMDG**

UN Number: 1120

Class: 3

Packing Group: II

EMS Number: F-E, S-D

Proper Shipping Name: BUTANOLS

Special Provisions: -

Marine Pollutant: No

**IATA**

UN Number: 1120

Class: 3

Packing Group: II

Proper Shipping Name: BUTANOLS

Pax/Cargo Pkg Inst: 353

Max Net Qty/Pkg: 5L

Cargo Aircraft Only Pkg Inst: 364

Max Net Qty/Pkg: 60L

Special Provisions: A3

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**SECTION 15: Regulatory information**

**Safety, health and environmental regulations specific for the product in question**

**Australia SUSMP**

Poison Schedule: NS

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## **SECTION 16: Other information**

### **Further information/disclaimer**

ChemSupply Australia Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon ChemSupply Australia Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of ChemSupply Australia Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.