

Rowe Scientific Esterification Reagent with Chloroform

ROWE SCIENTIFIC

Chemwatch: 4514-86

Version No: 7.1.1.1

Safety Data Sheet according to WHS and ADG requirements

Chemwatch Hazard Alert Code: 3

Issue Date: 16/07/2020

Print Date: 16/07/2020

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SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	Rowe Scientific Esterification Reagent with Chloroform
Synonyms	CE1405; Manufacturer's Code CE1405
Proper shipping name	FLAMMABLE LIQUID, TOXIC, N.O.S. (contains methanol and chloroform)
Other means of identification	Not Available

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Laboratory reagent.
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Details of the supplier of the safety data sheet

Registered company name	ROWE SCIENTIFIC
Address	11 Challenge Boulevard Wangara WA 6065 Australia
Telephone	+61 8 9302 1911
Fax	+61 8 9302 1905
Website	http://rowe.com.au/
Email	rowewa@rowe.com.au

Emergency telephone number

Association / Organisation	ROWE SCIENTIFIC
Emergency telephone numbers	+61 8 9302 1911 (24 Hrs)
Other emergency telephone numbers	Not Available

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

Poisons Schedule	S6
Classification [1]	Flammable Liquid Category 2, Acute Toxicity (Oral) Category 3, Acute Toxicity (Dermal) Category 3, Acute Toxicity (Inhalation) Category 3, Skin Corrosion/Irritation Category 2, Serious Eye Damage Category 1, Carcinogenicity Category 1A, Reproductive Toxicity Category 1B, Specific target organ toxicity - single exposure Category 1, Specific target organ toxicity - repeated exposure Category 2, Acute Aquatic Hazard Category 3
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

Label elements

Hazard pictogram(s)	
SIGNAL WORD	DANGER

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H350	May cause cancer.
H360D	May damage the unborn child.
H370	Causes damage to organs.

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H373	May cause damage to organs through prolonged or repeated exposure.
H402	Harmful to aquatic life.

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260	Do not breathe mist/vapours/spray.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/intrinsically safe equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P273	Avoid release to the environment.

Precautionary statement(s) Response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P307+P311	IF exposed: Call a POISON CENTER or doctor/physician.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P321	Specific treatment (see advice on this label).
P322	Specific measures (see advice on this label).
P330	Rinse mouth.
P362	Take off contaminated clothing and wash before reuse.
P370+P378	In case of fire: Use alcohol resistant foam or normal protein foam for extinction.
P302+P352	IF ON SKIN: Wash with plenty of water and soap.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P332+P313	If skin irritation occurs: Get medical advice/attention.

Precautionary statement(s) Storage

P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
67-56-1	30-60	<u>methanol</u>
67-66-3	30-60	<u>chloroform</u>
7664-93-9	<5	<u>sulfuric acid</u>
79-11-8	<1	<u>chloroacetic acid</u>

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> ▶ Immediately hold eyelids apart and flush the eye continuously with running water. ▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. ▶ Transport to hospital or doctor without delay. ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
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Skin Contact	<p>If skin contact occurs:</p> <ul style="list-style-type: none"> ▶ Immediately remove all contaminated clothing, including footwear. ▶ Flush skin and hair with running water (and soap if available). ▶ Seek medical attention in event of irritation.
Inhalation	<ul style="list-style-type: none"> ▶ If fumes or combustion products are inhaled remove from contaminated area. ▶ Lay patient down. Keep warm and rested. ▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▶ Transport to hospital, or doctor.
Ingestion	<p>If poisoning occurs, contact a doctor or Poisons Information Centre.</p> <ul style="list-style-type: none"> ▶ If swallowed do NOT induce vomiting. ▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▶ Observe the patient carefully. ▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▶ Seek medical advice. ▶ Avoid giving milk or oils. ▶ Avoid giving alcohol.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

DO NOT administer sympathomimetic drugs as they may cause ventricular arrhythmias.

For acute and short term repeated exposures to methanol:

- ▶ Toxicity results from accumulation of formaldehyde/formic acid.
- ▶ Clinical signs are usually limited to CNS, eyes and GI tract. Severe metabolic acidosis may produce dyspnea and profound systemic effects which may become intractable. All symptomatic patients should have arterial pH measured. Evaluate airway, breathing and circulation.
- ▶ Stabilise obtunded patients by giving naloxone, glucose and thiamine.
- ▶ Decontaminate with Ipecac or lavage for patients presenting 2 hours post-ingestion. Charcoal does not absorb well; the usefulness of cathartic is not established.
- ▶ Forced diuresis is not effective; haemodialysis is recommended where peak methanol levels exceed 50 mg/dL (this correlates with serum bicarbonate levels below 18 meq/L).
- ▶ Ethanol, maintained at levels between 100 and 150 mg/dL, inhibits formation of toxic metabolites and may be indicated when peak methanol levels exceed 20 mg/dL. An intravenous solution of ethanol in D5W is optimal.
- ▶ Folate, as leucovorin, may increase the oxidative removal of formic acid. 4-methylpyrazole may be an effective adjunct in the treatment. 8-Phenytoin may be preferable to diazepam for controlling seizure.

[Ellenhorn Barceloux: Medical Toxicology]

BIOLOGICAL EXPOSURE INDEX - BEI

Determinant	Index	Sampling Time	Comment
1. Methanol in urine	15 mg/l	End of shift	B, NS
2. Formic acid in urine	80 mg/gm creatinine	Before the shift at end of workweek	B, NS

B: Background levels occur in specimens collected from subjects **NOT** exposed.

NS: Non-specific determinant - observed following exposure to other materials.

SECTION 5 FIREFIGHTING MEASURES**Extinguishing media**

- ▶ Water spray or fog.
- ▶ Alcohol stable foam.
- ▶ Dry chemical powder.
- ▶ Carbon dioxide.

Special hazards arising from the substrate or mixture

Fire Incompatibility	Avoid contamination with strong oxidising agents as ignition may result
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Advice for firefighters

Fire Fighting	<ul style="list-style-type: none"> ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ May be violently or explosively reactive. ▶ Wear full body protective clothing with breathing apparatus. ▶ Prevent, by any means available, spillage from entering drains or water course. ▶ Consider evacuation (or protect in place). ▶ Fight fire from a safe distance, with adequate cover. ▶ If safe, switch off electrical equipment until vapour fire hazard removed. ▶ Use water delivered as a fine spray to control fire and cool adjacent area. ▶ Avoid spraying water onto liquid pools. ▶ Do not approach containers suspected to be hot. ▶ Cool fire exposed containers with water spray from a protected location. ▶ If safe to do so, remove containers from path of fire. ▶ Equipment should be thoroughly decontaminated after use.
Fire/Explosion Hazard	<ul style="list-style-type: none"> ▶ Liquid and vapour are highly flammable. ▶ Severe fire hazard when exposed to heat, flame and/or oxidisers. ▶ Vapour forms an explosive mixture with air. ▶ Severe explosion hazard, in the form of vapour, when exposed to flame or spark. ▶ Vapour may travel a considerable distance to source of ignition. ▶ Heating may cause expansion / decomposition with violent rupture of containers. ▶ On combustion, may emit toxic fumes of carbon monoxide (CO) <p>Other combustion products include: carbon dioxide (CO₂) chlorides</p>

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	and sulfur oxides (SO _x)
HAZCHEM	•3WE

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	<ul style="list-style-type: none"> ▶ Remove all ignition sources. ▶ Clean up all spills immediately. ▶ Avoid breathing vapours and contact with skin and eyes. ▶ Control personal contact with the substance, by using protective equipment. ▶ Contain and absorb small quantities with vermiculite or other absorbent material. ▶ Wipe up. ▶ Collect residues in a flammable waste container.
Major Spills	<ul style="list-style-type: none"> ▶ Clear area of personnel and move upwind. ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ May be violently or explosively reactive. ▶ Wear full body protective clothing with breathing apparatus. ▶ Prevent, by any means available, spillage from entering drains or water course. ▶ Consider evacuation (or protect in place). ▶ No smoking, naked lights or ignition sources. ▶ Increase ventilation. ▶ Stop leak if safe to do so. ▶ Water spray or fog may be used to disperse vapour. ▶ Contain or absorb spill with sand, earth or vermiculite. ▶ Use only spark-free shovels and explosion proof equipment. ▶ Collect recoverable product into labelled containers for recycling. ▶ Collect solid residues and seal in labelled drums for disposal. ▶ Wash area and prevent runoff into drains. ▶ After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using. ▶ If contamination of drains or waterways occurs, advise emergency services.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	<p>Avoid generating and breathing mist</p> <ul style="list-style-type: none"> ▶ Avoid all personal contact, including inhalation. ▶ Wear protective clothing when risk of exposure occurs. ▶ Use in a well-ventilated area. ▶ Prevent concentration in hollows and sumps. ▶ DO NOT enter confined spaces until atmosphere has been checked. ▶ Avoid smoking, naked lights, heat or ignition sources. ▶ When handling, DO NOT eat, drink or smoke. ▶ Vapour may ignite on pumping or pouring due to static electricity. ▶ DO NOT use plastic buckets. ▶ Earth and secure metal containers when dispensing or pouring product. ▶ Use spark-free tools when handling. ▶ Avoid contact with incompatible materials. ▶ Keep containers securely sealed. ▶ Avoid physical damage to containers. ▶ Always wash hands with soap and water after handling. ▶ Work clothes should be laundered separately. ▶ Use good occupational work practice. ▶ Observe manufacturer's storage and handling recommendations contained within this SDS. ▶ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.
Other information	<ul style="list-style-type: none"> ▶ Store in original containers in approved flame-proof area. ▶ No smoking, naked lights, heat or ignition sources. ▶ DO NOT store in pits, depressions, basements or areas where vapours may be trapped. ▶ Keep containers securely sealed. ▶ Store away from incompatible materials in a cool, dry well ventilated area. ▶ Protect containers against physical damage and check regularly for leaks. ▶ Observe manufacturer's storage and handling recommendations contained within this SDS.

Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none"> ▶ Glass container is suitable for laboratory quantities
Storage incompatibility	<p>Segregate from strong oxidising agents, strong acids, acid chlorides, acid anhydrides, reducing agents, alkali metals, beryllium dihydride, acetaldehyde, ethylene oxide, isocyanates, chloroform, potassium t-butoxide.</p> <p>Attacks, softens and may dissolve rubber, many plastics, paints and coatings</p>

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+ X + X + + +

- X** — Must not be stored together
O — May be stored together with specific precautions
+ — May be stored together

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	methanol	Methyl alcohol	200 ppm / 262 mg/m ³	328 mg/m ³ / 250 ppm	Not Available	Not Available
Australia Exposure Standards	chloroform	Chloroform	2 ppm / 10 mg/m ³	Not Available	Not Available	Not Available
Australia Exposure Standards	sulfuric acid	Sulphuric acid	1 mg/m ³	3 mg/m ³	Not Available	Not Available
Australia Exposure Standards	chloroacetic acid	Monochloroacetic acid	0.3 ppm / 1.2 mg/m ³	Not Available	Not Available	Not Available

EMERGENCY LIMITS

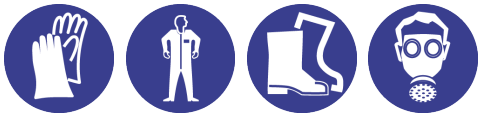
Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
methanol	Methanol; (Methyl alcohol)	Not Available	Not Available	Not Available
chloroform	Chloroform	2 ppm	Not Available	Not Available
sulfuric acid	Sulfuric acid	Not Available	Not Available	Not Available
chloroacetic acid	Chloroacetic acid; (Monochloroacetic acid)	1.5 ppm	Not Available	15 ppm

Ingredient	Original IDLH	Revised IDLH
methanol	6,000 ppm	Not Available
chloroform	500 ppm	Not Available
sulfuric acid	15 mg/m ³	Not Available
chloroacetic acid	Not Available	Not Available

Exposure controls

Appropriate engineering controls	<p>Use in a well-ventilated area</p> <p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.</p> <p>Employers may need to use multiple types of controls to prevent employee overexposure.</p> <p>General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.</p>										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;">Type of Contaminant:</th> <th style="width: 20%;">Air Speed:</th> </tr> </thead> <tbody> <tr> <td>solvent, vapours, degreasing etc., evaporating from tank (in still air).</td> <td>0.25-0.5 m/s (50-100 f/min)</td> </tr> <tr> <td>aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)</td> <td>0.5-1 m/s (100-200 f/min.)</td> </tr> <tr> <td>direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)</td> <td>1-2.5 m/s (200-500 f/min.)</td> </tr> <tr> <td>grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).</td> <td>2.5-10 m/s (500-2000 f/min.)</td> </tr> </tbody> </table>	Type of Contaminant:	Air Speed:	solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min)	aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)	direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)	grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)
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	<p>Within each range the appropriate value depends on:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Lower end of the range</th> <th style="width: 50%;">Upper end of the range</th> </tr> </thead> <tbody> <tr> <td>1: Room air currents minimal or favourable to capture</td> <td>1: Disturbing room air currents</td> </tr> <tr> <td>2: Contaminants of low toxicity or of nuisance value only.</td> <td>2: Contaminants of high toxicity</td> </tr> <tr> <td>3: Intermittent, low production.</td> <td>3: High production, heavy use</td> </tr> <tr> <td>4: Large hood or large air mass in motion</td> <td>4: Small hood-local control only</td> </tr> </tbody> </table>	Lower end of the range	Upper end of the range	1: Room air currents minimal or favourable to capture	1: Disturbing room air currents	2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity	3: Intermittent, low production.	3: High production, heavy use	4: Large hood or large air mass in motion	4: Small hood-local control only
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<p>Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.</p>											

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Personal protection	
Eye and face protection	<ul style="list-style-type: none"> ▶ Safety glasses with side shields; or as required, ▶ Chemical goggles. ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]
Skin protection	See Hand protection below
Hands/feet protection	Wear chemical protective gloves, e.g. PVC. Wear safety footwear.
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"> ▶ Overalls. ▶ Eyewash unit.

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:

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Material	CPI
BUTYL	C
BUTYL/NEOPRENE	C
NAT+NEOPR+NITRILE	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE	C
PE	C
PE/EVAL/PE	C
PVA	C
PVC	C
PVDC/PE/PVDC	C
SARANEX-23	C
SARANEX-23 2-PLY	C
TEFLON	C
VITON	C
VITON/NEOPRENE	C

* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

Respiratory protection

Type EAX-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	EAX-AUS P2	-	EAX-PAPR-AUS / Class 1 P2
up to 50 x ES	-	EAX-AUS / Class 1 P2	-
up to 100 x ES	-	EAX-2 P2	EAX-PAPR-2 P2 ^

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO₂), G = Agricultural chemicals, K = Ammonia(NH₃), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear, colourless, volatile liquid with heavy, "sweetish" ethereal odour; does not mix with water.		
Physical state	Liquid	Relative density (Water = 1)	Not Available
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	Not Applicable	Decomposition temperature	Not Available

Continued...

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Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	60	Molecular weight (g/mol)	Not Applicable
Flash point (°C)	<23	Taste	Not Available
Evaporation rate	Fast	Explosive properties	Not Available
Flammability	HIGHLY FLAMMABLE.	Oxidising properties	Not Available
Upper Explosive Limit (%)	31 methanol	Surface Tension (dyn/cm or mN/m)	Not Available
Lower Explosive Limit (%)	5.5 methanol	Volatile Component (%vol)	>90
Vapour pressure (kPa)	21 @ 20 degC	Gas group	Not Available
Solubility in water	Immiscible	pH as a solution (1%)	Not Applicable
Vapour density (Air = 1)	>1	VOC g/L	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	<p>The vapour is highly discomforting Inhalation hazard is increased at higher temperatures. Toxic effects are increased by consumption of alcohol. Chloroform concentrations of 1000-2000 parts per million (ppm) may cause dizziness, headache, fatigue, salivation and nausea. 4000 ppm may cause vomiting, serious disorientation and a fainting feeling. 14000-16000 ppm may cause rapid loss of consciousness. More than 20000 ppm may cause breathing failure, heart rhythm disturbances and death. If death does not immediately occur from stoppage of breathing or heart beat, it may occur later from liver and kidney damage. Minor but regular methanol exposures may effect the central nervous system, optic nerves and retinae. Symptoms may be delayed, with headache, fatigue, nausea, blurring of vision and double vision. Continued or severe exposures may cause damage to optic nerves, which may become severe with permanent visual impairment even blindness resulting. WARNING: Methanol is only slowly eliminated from the body and should be regarded as a cumulative poison which cannot be made non-harmful [CCINFO]</p>
Ingestion	<p>Strong evidence exists that exposure to the material may cause irreversible damage (other than cancer, mutations and birth defects) following a single exposure by swallowing. Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual. Ingestion may result in nausea, pain, vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis. Methanol may produce a burning or painful sensation in the mouth, throat, chest, and stomach. This may be accompanied by nausea, vomiting, headache, dizziness, shortness of breath, weakness, fatigue, leg cramps, restlessness, confusion, drunken behaviour, visual disturbance, drowsiness, coma and death. Symptoms of chloroform ingestion include burning of the mouth, throat, gullet and stomach; diarrhoea and abdominal/lower chest pain; cold, clammy skin, blueness of the extremities and face, muscle cramps, dilated pupils, low blood pressure, blood vessel dilatation on the periphery, irregular breathing, respiratory failure, unconsciousness and liver damage.</p>
Skin Contact	<p>Repeated absorption may result in heart, liver and kidney damage. There is strong evidence to suggest that this material, on a single contact with skin, can cause serious, irreversible damage of organs. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Toxic effects may result from skin absorption Bare unprotected skin should not be exposed to this material The material may accentuate any pre-existing skin condition</p>
Eye	<p>The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p>
Chronic	<p>Prolonged or continuous skin contact with the liquid may cause defatting with drying, cracking, irritation and dermatitis following. Long-term exposure to methanol vapour, at concentrations exceeding 3000 ppm, may produce cumulative effects characterised by gastrointestinal disturbances (nausea, vomiting), headache, ringing in the ears, insomnia, trembling, unsteady gait, vertigo, conjunctivitis and clouded or double vision. Liver and/or kidney injury may also result. Long term exposure to chloroform may produce dizziness, fatigue, drowsiness, memory impairment, increased dreams, loss of appetite, palpitations, liver and kidney damage. There may be depression, confusion, negative changes in behaviour and passive mood states. Chronic abuse of chloroform may cause psychotic behaviour. Repeated exposure may also cause dullness, urinary frequency, gastrointestinal disturbances, dry mouth, thirst, headache, general unwellness, blurred vision, pins and needles, loss of sense of balance, tremors, memory and anaemia. It may be dangerous to the foetus (unborn baby). It has been shown to induce liver, kidney, intestinal and urinary bladder tumours, including cancer.</p>

Rowe Scientific Esterification

TOXICITY

IRRITATION

Continued...

Rowe Scientific Esterification Reagent with Chloroform

Reagent with Chloroform	Not Available	Not Available
methanol	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 15800 mg/kg ^[2]	Eye (rabbit): 100 mg/24h-moderate
	Inhalation (rat) LC50: 36208.63875 mg/l/1H ^[2]	Eye (rabbit): 40 mg-moderate
	Oral (rat) LD50: =5300 mg/kg ^[2]	Eye: no adverse effect observed (not irritating) ^[1]
		Skin (rabbit): 20 mg/24 h-moderate
		Skin: no adverse effect observed (not irritating) ^[1]
chloroform	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >3980 mg/kg ^[2]	Eye (rabbit): 148 mg
	Inhalation (rat) LC50: 47.702 mg/l/4H ^[2]	Eye (rabbit):20 mg/24h - moderate
	Oral (rat) LD50: 300 mg/kg ^[2]	Skin (rabbit):10 mg/24h(open)-mild
		Skin (rabbit):500 mg/24h - mild
sulfuric acid	TOXICITY	IRRITATION
	Inhalation (guinea pig) LC50: 0.036 mg/l/8H ^[2]	Eye (rabbit): 1.38 mg SEVERE
	Oral (rat) LD50: 2140 mg/kg ^[2]	Eye (rabbit): 5 mg/30sec SEVERE
chloroacetic acid	TOXICITY	IRRITATION
	dermal (rat) LD50: =305 mg/kg ^[2]	Not Available
	Oral (rat) LD50: =55 mg/kg ^[2]	
Legend:	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. * Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

CHLOROFORM	WARNING: This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans. Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [National Toxicology Program: U.S. Dep. of Health & Human Services 2002]
SULFURIC ACID	WARNING: For inhalation exposure <u>ONLY</u> : This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS Occupational exposures to strong inorganic acid mists of sulfuric acid:
CHLOROACETIC ACID	<p>For acid mists, aerosols, vapours</p> <p>Test results suggest that eukaryotic cells are susceptible to genetic damage when the pH falls to about 6.5. Cells from the respiratory tract have not been examined in this respect. Mucous secretion may protect the cells of the airway from direct exposure to inhaled acidic mists (which also protects the stomach lining from the hydrochloric acid secreted there).</p> <p>for monochloroacetic acid (MCA) and sodium monochloroacetate (SMCA)</p> <p>The anticipated acute and chronic human health hazards posed by MCA/SMCA are effects on the cardiac system, the central nervous system, and kidneys. Chronic exposure may also result in hepatotoxicity and teratogenic effects (SMCA tested only). In addition, MCA is highly corrosive and irritating to the eyes, skin and respiratory tract.</p> <p>The toxicity profile of MCA and SMCA are similar for the oral route of exposure. However, SMCA is much less toxic than MCA by the dermal route in acute studies indicating that dermal absorption of MCA is greater than for SMCA. Toxicity associated with inhalation exposure is difficult to determine for MCA because of poor study design and/or inadequate reporting of available studies: studies for SMCA are not available. However, due to the corrosive property of MCA and toxicity profile of MCA/SMCA it is prudent to recommend that exposure by the inhalation to MCA and SMCA should be avoided.</p> <p>Acute dermal exposure of workers to MCA may result in death even after rapid and extensive washing of the skin area. The effects may be delayed. However, under "normal" exposure conditions with strict use of recommended protective measures it is envisaged that exposure and subsequent effects will be low. It has been suggested that oral and inhalation absorption may be limited because of the irritating effects of MCA and that the low odour threshold for MCA (0.01 ppm, 0.042 mg/m³) indicates good alert properties of the compound. In contrast, SMCA is less irritating and therefore oral, inhalation dermal exposure may occur unobserved. Because SMCA forms dusts, inhalation and dermal exposure may represent important routes of exposure.</p> <p>The biochemical mechanism of action resulting in death is not understood. Contributing factors apparently believed to be involved are: (i) the inhibition of the tricarboxylic acid cycle decreasing cellular energy supply and increasing acidosis with glycolic acid and oxalate production, and; (ii) effects on cellular components where sulfhydryl groups are critical for normal biological activity. Both of these effects may contribute to CNS, cardiovascular, renal and hepato effects. In addition, the metabolites glycolic acid and oxalates may contribute to CNS and renal toxicity.</p> <p>Monofluoroacetic acid (MFA; CAS No. 144-49-0), moniodoacetic acid (MIA: CAS No. 64-69-7), monobromoacetic acid (MBA; CAS No. 79-08-3) and the sodium salts of MFA and MIA (CAS No. 62-74-8 and 305-53-3) are close structural analogues of MCA and SMCA. MFA is more toxic than MCA but it is also corrosive and may cause effects on the cardiac system, the central nervous system and kidneys which may result in death. However, MCA apparently has a different mechanism of action than its structural halo analogues. For example, both MCA and MFA inhibit aconitase required for acetate metabolism in the tricarboxylic acid cycle but their inhibition kinetics are different. In addition, MCA like MIA but unlike MFA depletes organ thiols. Hence, comparison of MCA or SMCA with its structural halo analogues for risk assessment or identifying antidotes should only be done with prudence.</p> <p>In high concentrations over a short period of time, exposure to haloacetic acids in drinking water can cause severe irritation to skin.</p> <p>Trichloroacetic acid, a type of haloacetic acid, is used clinically as a chemical skin peel. Exposure to high levels of trichloroacetic acid causes loss of skin, inflammation, and degeneration of the structural protein collagen. In some cases, the skin damage can last for 2-15 weeks.</p> <p>Animal testing showed that exposure to varying levels of haloacetic acid leads to an increase in the development of liver tumours and liver cancer.</p> <p>Animal studies show that exposure to high levels of haloacetic acid may also increase the risk of birth defects.</p> <p>Equivocal tumorigen by RTECS criteria</p>
METHANOL & CHLOROFORM	The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

Rowe Scientific Esterification Reagent with Chloroform

SULFURIC ACID & CHLOROACETIC ACID

Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.

Acute Toxicity	✓	Carcinogenicity	✓
Skin Irritation/Corrosion	✓	Reproductivity	✓
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✓
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✓
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
 ✓ – Data available to make classification

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Rowe Scientific Esterification Reagent with Chloroform	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available
methanol	LC50	96	Fish	11-850mg/L	2
	EC50	48	Crustacea	>10-mg/L	2
	EC50	96	Algae or other aquatic plants	16.912mg/L	4
	BCF	24	Algae or other aquatic plants	0.05mg/L	4
	EC0	48	Crustacea	>10-mg/L	2
	NOEC	72	Crustacea	0.1mg/L	4
chloroform	LC50	96	Fish	=3mg/L	1
	EC50	48	Crustacea	=29mg/L	1
	EC50	72	Algae or other aquatic plants	13.3mg/L	5
	NOEC	6480	Fish	0.151mg/L	2
sulfuric acid	LC50	96	Fish	=8mg/L	1
	EC50	48	Crustacea	=42.5mg/L	1
	EC50	72	Algae or other aquatic plants	>100mg/L	2
	NOEC	Not Available	Crustacea	0.15mg/L	2
chloroacetic acid	LC50	96	Fish	71.7mg/L	2
	EC50	48	Crustacea	75mg/L	2
	EC50	72	Algae or other aquatic plants	=0.025mg/L	1
	NOEC	72	Algae or other aquatic plants	<0.005mg/L	1

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
methanol	LOW	LOW
chloroform	HIGH (Half-life = 1800 days)	HIGH (Half-life = 259.63 days)
chloroacetic acid	LOW (Half-life = 14 days)	MEDIUM (Half-life = 95.83 days)

Bioaccumulative potential

Ingredient	Bioaccumulation
methanol	LOW (BCF = 10)

Continued...

Rowe Scientific Esterification Reagent with Chloroform

chloroform	LOW (BCF = 13)
chloroacetic acid	LOW (LogKOW = 0.22)

Mobility in soil

Ingredient	Mobility
methanol	HIGH (KOC = 1)
chloroform	LOW (KOC = 35.04)
chloroacetic acid	HIGH (KOC = 1.201)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> ▶ Consult manufacturer for recycling options and recycle where possible . ▶ Consult State Land Waste Management Authority for disposal. ▶ Incinerate residue at an approved site. ▶ Recycle containers if possible, or dispose of in an authorised landfill.
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SECTION 14 TRANSPORT INFORMATION

Labels Required

	 
Marine Pollutant	NO
HAZCHEM	•3WE

Land transport (ADG)

UN number	1992				
UN proper shipping name	FLAMMABLE LIQUID, TOXIC, N.O.S. (contains methanol and chloroform)				
Transport hazard class(es)	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Class</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">3</td> </tr> <tr> <td>Subrisk</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">6.1</td> </tr> </table>	Class	3	Subrisk	6.1
Class	3				
Subrisk	6.1				
Packing group	II				
Environmental hazard	Not Applicable				
Special precautions for user	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Special provisions</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">274</td> </tr> <tr> <td>Limited quantity</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">1 L</td> </tr> </table>	Special provisions	274	Limited quantity	1 L
Special provisions	274				
Limited quantity	1 L				

Air transport (ICAO-IATA / DGR)

UN number	1992														
UN proper shipping name	Flammable liquid, toxic, n.o.s. * (contains methanol and chloroform)														
Transport hazard class(es)	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">ICAO/IATA Class</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">3</td> </tr> <tr> <td>ICAO / IATA Subrisk</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">6.1</td> </tr> <tr> <td>ERG Code</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">3HP</td> </tr> </table>	ICAO/IATA Class	3	ICAO / IATA Subrisk	6.1	ERG Code	3HP								
ICAO/IATA Class	3														
ICAO / IATA Subrisk	6.1														
ERG Code	3HP														
Packing group	II														
Environmental hazard	Not Applicable														
Special precautions for user	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Special provisions</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">A3</td> </tr> <tr> <td>Cargo Only Packing Instructions</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">364</td> </tr> <tr> <td>Cargo Only Maximum Qty / Pack</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">60 L</td> </tr> <tr> <td>Passenger and Cargo Packing Instructions</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">352</td> </tr> <tr> <td>Passenger and Cargo Maximum Qty / Pack</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">1 L</td> </tr> <tr> <td>Passenger and Cargo Limited Quantity Packing Instructions</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">Y341</td> </tr> <tr> <td>Passenger and Cargo Limited Maximum Qty / Pack</td> <td style="border-left: 1px dashed black; border-right: 1px dashed black;">1 L</td> </tr> </table>	Special provisions	A3	Cargo Only Packing Instructions	364	Cargo Only Maximum Qty / Pack	60 L	Passenger and Cargo Packing Instructions	352	Passenger and Cargo Maximum Qty / Pack	1 L	Passenger and Cargo Limited Quantity Packing Instructions	Y341	Passenger and Cargo Limited Maximum Qty / Pack	1 L
Special provisions	A3														
Cargo Only Packing Instructions	364														
Cargo Only Maximum Qty / Pack	60 L														
Passenger and Cargo Packing Instructions	352														
Passenger and Cargo Maximum Qty / Pack	1 L														
Passenger and Cargo Limited Quantity Packing Instructions	Y341														
Passenger and Cargo Limited Maximum Qty / Pack	1 L														

Sea transport (IMDG-Code / GGVSee)

UN number	1992
UN proper shipping name	FLAMMABLE LIQUID, TOXIC, N.O.S. (contains methanol and chloroform)

Rowe Scientific Esterification Reagent with Chloroform

Transport hazard class(es)	IMDG Class	3
	IMDG Subrisk	6.1
Packing group	II	
Environmental hazard	Not Applicable	
Special precautions for user	EMS Number	F-E , S-D
	Special provisions	274
	Limited Quantities	1 L

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

METHANOL IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Inventory of Chemical Substances (AICS)

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Chemical Footprint Project - Chemicals of High Concern List

CHLOROFORM IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Inventory of Chemical Substances (AICS)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 2
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B : Possibly carcinogenic to humans

SULFURIC ACID IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Inventory of Chemical Substances (AICS)
Chemical Footprint Project - Chemicals of High Concern List

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1 : Carcinogenic to humans

CHLOROACETIC ACID IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Inventory of Chemical Substances (AICS)

ECHA SUMMARY

Ingredient	CAS number	Index No	ECHA Dossier
methanol	67-56-1	603-001-00-X	01-2119392409-28-XXXX 01-2120762095-54-XXXX

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
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1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
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Rowe Scientific Esterification Reagent with Chloroform

1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
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1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370
1	Flam. Liq. 2; Acute Tox. 3; Acute Tox. 3; Acute Tox. 3; STOT SE 1	GHS02; GHS08; GHS06; Dgr	H225; H301; H311; H331; H370

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.

Ingredient	CAS number	Index No	ECHA Dossier
chloroform	67-66-3	602-006-00-4	01-2119486657-20-XXXX

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2; Acute Tox. 3; Carc. 2; Repr. 2; STOT RE 1; STOT RE 2	GHS08; GHS06; Dgr	H302; H315; H319; H331; H351; H361; H372

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.

Ingredient	CAS number	Index No	ECHA Dossier
sulfuric acid	7664-93-9	016-020-00-8	01-2119458838-20-XXXX 01-2120080820-60-XXXX

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Skin Corr. 1A	GHS05; Dgr	H314
1	Skin Irrit. 2; Eye Irrit. 2	GHS07; Wng	H315; H319

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.

Ingredient	CAS number	Index No	ECHA Dossier
chloroacetic acid	79-11-8	607-003-00-1	01-2119459589-18-XXXX 01-2120046372-63-XXXX 01-2119998841-20-XXXX 01-2119998839-05-XXXX 01-2119998840-22-XXXX

Harmonisation (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Acute Tox. 3; Acute Tox. 3; Skin Corr. 1B; Eye Dam. 1; Acute Tox. 1; STOT SE 3; Aquatic Acute 1	GHS09; GHS05; GHS06; Dgr	H311; H314; H318; H330; H335; H400

Harmonisation Code 1 = The most prevalent classification. Harmonisation Code 2 = The most severe classification.

National Inventory Status

National Inventory	Status
Australia - AICS	Yes
Canada - DSL	Yes
Canada - NDSL	No (methanol; chloroform; sulfuric acid; chloroacetic acid)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - ARIPS	Yes
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Revision Date	16/07/2020
Initial Date	28/03/2003

SDS Version Summary

Version	Issue Date	Sections Updated
6.1.1.1	01/11/2019	One-off system update. NOTE: This may or may not change the GHS classification
7.1.1.1	16/07/2020	Physical Properties, Name

Rowe Scientific Esterification Reagent with Chloroform**Other information**

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit.
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index

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