

1. IDENTIFICATION

Product Name	Sulfamic acid
Other Names	Aminosulfonic acid; Sulphamic acid; Sulphamidic acid
Uses	Manufacture of sodium cyclamate, manufacture of flame retardents, descaling, acid cleaning, nitrite removal, anodizing metals and electroplating.
Chemical Family	No Data Available
Chemical Formula	H3NO3S
Chemical Name	Sulfamic acid
Product Description	Inorganic acid.

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Pty Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details


For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) 6

Globally Harmonised System

Hazard Classification	Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)		
Hazard Categories	Skin Corrosion/Irritation - Category 2 Serious Eye Damage/Irritation - Category 2A Long-term Hazard To The Aquatic Environment - Category 3		
Pictograms			
Signal Word	Warning		
Hazard Statements	H315	Causes skin irritation.	
	H319	Causes serious eye irritation.	
	H412	Harmful to aquatic life with long lasting effects.	
Precautionary Statements	Prevention	P264	Wash exposed skin thoroughly after handling.
		P273	Avoid release to the environment.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
	Response	P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P321	Specific treatment (see First Aid Measures on Safety Data Sheet).
		P332 + P313	If skin irritation occurs: Get medical advice/attention.
		P337 + P313	If eye irritation persists: Get medical advice/attention.
		P362	Take off contaminated clothing and wash before reuse.
	Disposal	P501	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications	Health Hazards	6.1D	Substances that are acutely toxic - Harmful
		6.1E	Substances that are acutely toxic –May be harmful, Aspiration hazard
		8.1A	Substances that are corrosive to metals
		8.2C	Substances that are corrosive to dermal tissue UN PGIII
		8.3A	Substances that are corrosive to ocular tissue
	Environmental Hazards	9.1C	Substances that are harmful in the aquatic environment
		9.3C	Substances that are harmful to terrestrial vertebrates

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Sulphamic Acid	H3NO3S	5329-14-6	100.00 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	If swallowed, do NOT induce vomiting. Rinse mouth with water. Give water to drink provided victim is conscious. If vomiting occurs, lean patient forward or place on left side (head-down position if possible) to maintain open airway and prevent aspiration. Seek immediate medical attention.
Eye	Get medical advice/attention. If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing for at least 15 minutes, or until advised to stop by a Poisons Information Centre or a doctor/physician. Remove contact lenses, if present and easy to do. Continue rinsing. Take care not to rinse contaminated water into the non-affected eye. If eye irritation persists, get medical advice/attention.
Skin	Get medical advice/attention. If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre (e.g. phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor/physician. If skin irritation occurs, get medical advice/attention. Wash contaminated clothing before reuse.
Inhaled	Remove victim from exposure to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth to mouth method. Induce artificial respiration with the aid of a pocket mask equipped with a one way valve or other proper respiratory medical device. Seek medical attention.
Advice to Doctor	Symptoms of poisoning may develop several hours following exposure; medical observation therefore necessary for at least 48 hours. Indication of any immediate medical attention and special treatment needed Symptoms of irritation to skin, eyes or lungs. Symptoms of exposure may include abdominal pain, vomiting, diarrhea, drop in blood pressure, burning sensation, shock.
Medical Conditions Aggravated by Exposure	Most important symptoms and effects, both acute and delayed: irritant effects,cough,shortness of breath. Inflammation of eye (redness, watering, itching, pain). Corneal damage. Skin inflammation (itching, scaling, reddening, pain, or occasionally, blistering). The following symptoms may occur: Pulmonary oedema; Lung irritation; Oesophagogastric injuries.

5. FIRE FIGHTING MEASURES

General Measures	Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas. Eliminate ignition sources. Move fire exposed containers from fire area if it can be done without risk. Do NOT move cargo if cargo has been exposed to heat. Dam fire control water for later disposal. Avoid generating dust.
Flammability Conditions	Non-flammable.
Extinguishing Media	In case of fire, use appropriate extinguishing media most suitable for surrounding fire conditions include Foam; Carbon dioxide (CO2); Water spray jet.
Fire and Explosion Hazard	Non - combustible. Ambient fire may liberate hazardous vapours. Special hazards arising from the substance or mixture: In case of fire may be liberated: Ammonia (NH3); Nitrogen oxides (NOx); Sulfur oxides (SOx). Keep away from: Alkali, Cyanides, Oxidising Agents. Reacts violently with chlorine and fuming nitric acid causing explosion hazard.
Hazardous Products of Combustion	Generates dangerous gases or fumes in contact with : halogens, alkalines,oxidizing agents,nitrates,nitrites,nitric acid,metal and water. Fire may cause evolution of : sulphur dioxides, nitrogen oxides.
Special Fire Fighting Instructions	Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment.
Personal Protective Equipment	Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves) or chemical splash suit. Please note: Structural fire fighters uniform will provide limited protection.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	2X

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Avoid accidents, clean up immediately. Increase ventilation. Isolate the danger area. Use clean, non-sparking tools and equipment. Shut off all possible sources of ignition. Consult an expert. Avoid generation for dust; do not inhale dusts.
Clean Up Procedures	Cover drains. Collect, bind, and pump off spills. Take up dry . Avoid generation of dusts. Ensure all waste is collected and treated via a waste water treatment plant.
Containment	Stop leak if safe to do so.
Decontamination	Dilute with plenty of water. Neutralize. Suitable material for diluting or neutralizing: Lime; Soda ash.
Environmental Precautionary Measures	Do not allow product to reach drains, sewers or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Authority.
Evacuation Criteria	Evacuate all unnecessary personnel.
Personal Precautionary Measures	Personnel involved in the clean up should wear full protective clothing as listed in section 8.

7. HANDLING AND STORAGE

Handling	Ensure an eye bath and safety shower are available and ready for use. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling. Take precautionary measures against static discharges by bonding and grounding equipment. Avoid contact with eyes, skin and clothing. Do not inhale product dust. Avoid prolonged or repeated exposure. Remove contaminated clothing and wash before reuse. Keep away from combustible material. Chemicals should be used only by those trained in handling potentially hazardous materials. Observe label precautions. Open and handle container with care.
Storage	Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for deficiencies such as damage or leaks. Protect against physical damage. Store away from incompatible materials as listed in section 10. Keep away from: Alkali, Cyanides, Oxidising Agents.
Container	Store in original packaging as approved by manufacturer. Suitable container/equipment material: Acid-resistant.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	The following exposure standard has been established by The Australian Safety and Compensation Council (ASCC); DNELs (workplace): DNEL inhalation (8 h): 7.5 mg/m ³ DNELs (consumer): DNEL oral: 1.06 mg/kg bw/day DNEL inhalation: 1.85 mg/m ³ These exposure standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.
Exposure Limits	No Data Available
Biological Limits	PNECs: PNEC aqua (freshwater): 0.3 mg/L PNEC sediment (freshwater): 0.3 mg/kg sediment dw PNEC aqua (marine water): 0.03 mg/L PNEC sediment (marine water): 0.03 mg/kg sediment dw
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Adequate ventilation should be provided so that exposure limits are not exceeded. Measures to prevent aerosol and dust generation: Technical ventilation of workplace. Where necessary/ appropriate: Use the following local exhaust ventilation types: Receptor hood for dust.
Personal Protection Equipment	RESPIRATOR: Required when dust are generated. Recommended filter type: Filter B-(P2). EYES: Wear safety glasses with side protection according to EN 166 (AS1336/1337). HANDS: Full contact/splash contact: Nitrile rubber (glove thickness 0.11 mm; break-through time >480 min). CLOTHING: Long-sleeved protective coveralls and safety footwear (AS3765/2210).
Special Hazards Precautions	CORROSIVE. Avoid contact with eyes. Avoid contact with skin.

Wash thoroughly after handling. Wear protective gloves, protective clothing, eye protection, face protection. Specific treatment (see First Aid Measures on Safety Data Sheet).

Work Hygienic Practices

Immediately change contaminated clothing. Apply preventive skin protection. Wash hand and face after working with substance.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Crystals
Odour	Odourless
Colour	White
pH	1.18 1% solution @ 25°C
Vapour Pressure	0.0078 hPa (@ No Data Available)
Relative Vapour Density	3.35
Boiling Point	Decomposes
Melting Point	205 °C
Freezing Point	No Data Available
Solubility	213 g/L 20°C
Specific Gravity	2.13 g/cm ³
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	approx 1.3 kg/m ³
Corrosion Rate	No Data Available
Decomposition Temperature	>=209 °C
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	log Pow: 0.10
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	No Data Available
Potential for Dust Explosion	No information available.
Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No information available.
Properties That May Initiate or Contribute to Fire Intensity	No information available.
Reactions That Release Gases or Vapours	No information available.
Release of Invisible Flammable Vapours and Gases	No information available.

10. STABILITY AND REACTIVITY

Chemical Stability	The product is chemically stable under standard ambient conditions (room temperature).
Conditions to Avoid	Avoid heating.
Materials to Avoid	Avoid strong oxidisers, Nitric acid, Chlorine. Solutions are strong acids and react violently with bases.
Hazardous Decomposition Products	Generates dangerous gases or fumes in contact with: halogens, alkalis, oxidising agents, nitrates, nitrites, nitric acid, metal and water. Ambient fire may liberate hazardous vapours. Fire may cause evolution of: sulphur dioxides, nitrogen oxides.
Hazardous Polymerisation	Dangerous reactions are not expected handling the product according to its intended use.

11. TOXICOLOGICAL INFORMATION

General Information	No Data Available
Acute	
Ingestion	ACUTE TOXICITY: ORAL Rat LD50 >2,000 mg/kg (OECD 401) SYMPTOMS: irritations of mucous membranes in the mouth,pharynx,oesophagus and gastrointestinal tract.
Inhalation	ACUTE TOXICITY: INHALATION SYMPTOMS: cough,shortness of breath,irritation symptoms in the respiratory tract.
SkinIrritant	SKIN CORROSION/IRRITATION: SPECIES: Rabbit RESULT: Irritant METHOD: OECD test guideline 404
Eyelrritant	EYE DAMAGE/IRRITATION: SPECIES: Rabbit RESULT: Severe irritation METHOD: OECD test guideline 405
Mutagenicity	Mutagenicity (mammal cell test): micronucleus Result: negative Method: OECD test guideline 474 Ames test: Salmonella typhimurium Result: negative Method: OECD test guideline 471
Carcinogen Category	No

12. ECOLOGICAL INFORMATION

Ecotoxicity	Toxicity to fish: Species: pimephales promelas (fathead minnow) LC50: 70.3 mg/l Exposure time : 96 h Method : OECD test guideline 203 Toxicity to bacteria: Species: Pseudomonas putida EC10 >= 1.000 mg/l Exposure time: 16 h Method: IUCLID
Persistence/Degradability	No information available.
Mobility	No information available.
Environmental Fate	Harmful effect due to pH shift. Do not allow to run into surface waters, wastewater, or soil.
Bioaccumulation Potential	Partition coefficient: n-octanol/water log Pow: 0.10 Method: experimental (Lit.) Bioaccumulation is not expected (log Pow <1)

Environmental Impact

No Data Available

13. DISPOSAL CONSIDERATIONS**General Information**

Dispose of in accordance with all local, state and federal regulations. All empty packaging should be disposed of in accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility.

Special Precautions for Land Fill

Contact a specialist disposal company or the local waste regulator for advice.

14. TRANSPORT INFORMATION**Land Transport (Australia)**

ADG Code

Proper Shipping Name	SULPHAMIC ACID
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2967
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (Malaysia)

ADR

Proper Shipping Name	SULPHAMIC ACID
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2967
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (New Zealand)

NZS5433

Proper Shipping Name	SULPHAMIC ACID
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2967
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (United States of America)

US DOT

Proper Shipping Name	SULPHAMIC ACID
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	154 Substances - Toxic and/or Corrosive (Non-Combustible)
UN Number	2967
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Sea Transport

IMDG Code

Proper Shipping Name	SULPHAMIC ACID
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	2967
Hazchem	2X
Pack Group	III
Special Provision	No Data Available
EMS	F-A, S-B
Marine Pollutant	No

Air Transport

IATA DGR

Proper Shipping Name	SULPHAMIC ACID
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	2967
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)
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15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	6

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR001549
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National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Listed
Canada (NDSL)	Not Listed
China (IECSC)	Listed
Europe (EINECS)	226-218-8
Europe (REACH)	Listed
Japan (ENCS/METI)	Listed
Korea (KECI)	Listed
Malaysia (EHS Register)	Listed
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Listed
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Listed
USA (TSCA)	Listed

16. OTHER INFORMATION

Related Product Codes	SUACID1000, SUACID1001, SUACID1002, SUACID1003, SUACID1004, SUACID1005, SUACID1006, SUACID1007, SUACID1008, SUACID1009, SUACID1010, SUACID1011, SUACID1012, SUACID1013, SUACID1014, SUACID1800, SUACID1801, SUACID1802, SUACID1803, SUACID1804, SUACID1805, SUACID1806, SUACID1807, SUACID1808, SUACID1809, SUACID1810, SUACID1811, SUACID1812, SUACID1813, SUACID1814, SUACID1815, SUACID1816, SUACID1817, SUACID1818, SUACID1850, SUACID1900, SUACID1901, SUACID1950, SUACID2000, SUACID2001, SUACID2002, SUACID2003, SUACID2004, SUACID2005, SUACID2006, SUACID2007, SUACID2009, SUACID2050, SUACID2100, SUACID2150, SUACID2500, SUACID2550, SUACID2600, SUACID2650, SUACID2800, SUACID2850, SUACID3000, SUACID3100, SUACID3300, SUACID3500, SUACID3501, SUACID3550, SUACID3600, SUACID3700, SUACID4000, SUACID4001, SUACID4500, SUACID4800, SUACID5000, SUACID6000, SUACID6001, SUACID6500, SUACID6501, SUACID6502, SUACID6503, SUACID6504, SUACID6505, SUACID6506, SUACID6507, SUACID6508, SUACID6509, SUACID6510, SUACID6511, SUACID6512, SUACID6513, SUACID6514, SUACID6515, SUACID6516, SUACID6517, SUACID6518, SUACID6519, SUACID6520, SUACID6521, SUACID6522, SUACID6523, SUACID7000, SUACID7001, SUACID8000, SUACID8050, SUACID8055, SUACID8100, SUACID8500, SUACID9000, SUACID9050, SUACID9300, SUACID9500, SUACID9550
Revision	3
Revision Date	01 Jan 2017
Key/Legend	<p>< Less Than > Greater Than AICS Australian Inventory of Chemical Substances atm Atmosphere CAS Chemical Abstracts Service (Registry Number) cm² Square Centimetres CO₂ Carbon Dioxide COD Chemical Oxygen Demand deg C (°C) Degrees Celcius EPA (New Zealand) Environmental Protection Authority of New Zealand deg F (°F) Degrees Farenheit g Grams g/cm³ Grams per Cubic Centimetre g/l Grams per Litre HSNO Hazardous Substance and New Organism</p>

IDLH Immediately Dangerous to Life and Health

immiscible Liquids are insoluble in each other.

inHg Inch of Mercury

inH₂O Inch of Water

K Kelvin

kg Kilogram

kg/m³ Kilograms per Cubic Metre

lb Pound

LC₅₀ LC stands for lethal concentration. LC₅₀ is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.

LD₅₀ LD stands for Lethal Dose. LD₅₀ is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.

ltr or **L** Litre

m³ Cubic Metre

mbar Millibar

mg Milligram

mg/24H Milligrams per 24 Hours

mg/kg Milligrams per Kilogram

mg/m³ Milligrams per Cubic Metre

Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.

mm Millimetre

mmH₂O Millimetres of Water

mPa.s Millipascals per Second

N/A Not Applicable

NIOSH National Institute for Occupational Safety and Health

NOHSC National Occupational Health and Safety Commission

OECD Organisation for Economic Co-operation and Development

Oz Ounce

PEL Permissible Exposure Limit

Pa Pascal

ppb Parts per Billion

ppm Parts per Million

ppm/2h Parts per Million per 2 Hours

ppm/6h Parts per Million per 6 Hours

psi Pounds per Square Inch

R Rankine

RCP Reciprocal Calculation Procedure

STEL Short Term Exposure Limit

TLV Threshold Limit Value

tne Tonne

TWA Time Weighted Average

ug/24H Micrograms per 24 Hours

UN United Nations

wt Weight