Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Sulfamic Acid
Chemical Formula: H₅NO₃S
CAS Number: 5329-14-6
Other Designations: amidosulfonic acid, amidosulfuric acid, aminosulfonic acid, sulfamidic acid, sulphamic acid.
Derivation: Produced from chlorosulfonic acid and ammonia or by heating urea with sulfuric acid.
General Use: Used as a standard in alkalimetry, in acid cleaning, nitrite removal, chlorine stabilization for swimming pools cooling towers, and paper mills, as a catalyst for urea-formaldehyde resins, and as a sulfonating agent.
Emergency Telephone: (ChemTel) Contract M1300000345; 800 255-3924; INTL 813 248-0585

Section 2 - Hazards Identification

Warning: Sulfamic acid exists as odorless, white crystals. It is a strong acid and causes severe irritation or burns upon contact with the eyes, skin, or mucous membranes of the respiratory tract. Inhalation of high levels can cause pulmonary edema (fluid in the lungs) which may be life-threatening. Be sure to wear safety glasses and gloves when handling this material.

Potential Health Effects
Primary Entry Routes: Inhalation, skin and eye contact, ingestion.
Target Organs: Eyes, skin, respiratory tract, gastrointestinal tract. Central nervous system, liver, kidneys, and cardiovascular system (secondary to burns and circulatory collapse).

HAZARDS IDENTIFICATION
Classification of the substance or mixture
GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412
GHS Label elements, including precautionary statements
Pictogram

Signal word Warning
Hazard statement(s)
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H412 Harmful to aquatic life with long lasting effects.
Precautionary statement(s)
P264 Wash skin thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.
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 supplemental first aid instructions on this label).
Sulfamic Acid

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.
P501 Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified (HINOC) or not covered by GHS - none

Acute Effects

Inhalation: Inhalation of sulfamic acid particulates can cause severe irritation and burns of the nose and respiratory tract. Inhalation of high levels can cause pulmonary edema (fluid in the lungs) which may be delayed up to 48 hrs.
Eye: Severe irritation and burns. Scarring may be permanent.
Skin: Severe irritation and burns. Scarring may be permanent.
Ingestion: The mouth and esophagus may appear grayish-white progressing to black with a shrunken and wrinkled texture. Esophageal or stomach perforation may occur. Circulatory collapse occurs in extreme cases with clammy skin, weak and rapid pulse, shallow respiration, and scanty urine. Uncorrected circulatory collapse can cause kidney failure and ischemic (localized tissue anemia due to decreased inflow of arterial blood) lesions of the heart and liver. Death is generally due to circulatory collapse or asphyxiation due to glottic edema (fluid and swelling in the epiglottis which causes insufficient oxygen to reach the windpipe). The estimated human lethal dose is 0.5 to 5 g/kg (1 oz to 1 pint for a 70 kg/150 lb person).

Carcinogenicity: IARC, NTP, and OSHA do not list sulfamic acid as a carcinogen.

Medical Conditions Aggravated by Long-Term Exposure: None reported.

Chronic Effects: None reported

Section 3 - Composition / Information on Ingredients

<table>
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<tr>
<th>Ingredient Name</th>
<th>CAS Number</th>
<th>EINECS/ELINCS</th>
<th>% wt or % vol</th>
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<td>Sulfamic Acid</td>
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<td>266-218-8</td>
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<th>TWA</th>
<th>STEL</th>
<th>TWA</th>
<th>STEL</th>
<th>IDLH</th>
</tr>
</thead>
</table>

Section 4 - First Aid Measures

Inhalation: Remove exposed person to fresh air and support breathing as needed.
Eye Contact: Do not allow victim to rub or keep eyes tightly shut. Gently lift eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician or ophthalmologist immediately.
Skin Contact: Quickly remove contaminated clothing (if not stuck to skin). Rinse with flooding amounts of water for at least 15 min. For reddened or blistered skin, consult a physician.
Ingestion: Never give anything by mouth to an unconscious or convulsing person. Contact a poison control center. Unless the poison control center advises otherwise, have the conscious and alert person drink 1 to 2 glasses of water to dilute. Do not induce vomiting because of the corrosive nature of sulfamic acid. Vomiting will worsen esophageal condition.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: Treatment is symptomatic and supportive. Treat as for thermal burns. Severe inhalation exposures may result in delayed pulmonary edema; in these cases consider close observation for 24 to 48 hr.

Section 5 - Fire-Fighting Measures

Flash Point: Noncombustible
Flash Point Method: 
Burning Rate: 
Autoignition Temperature: Noncombustible
LEL: 
UEL: 
Flammability Classification: 
Extinguishing Media: Use agent suitable for surrounding fire.
Unusual Fire or Explosion Hazards: Emits toxic gases when heated.
Hazardous Fire or Explosion Products: Sulfur oxide(s), nitrogen oxide(s), and ammonia gas.
Fire-Fighting Instructions: Do not release runoff from fire control methods to sewers or waterways.
Fire-Fighting Equipment: Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode.

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Sulfamic Acid

Section 6 - Accidental Release Measures

Spill /Leak Procedures: Notify safety personnel, isolate and ventilate area, deny entry, and stay upwind.
Small Spills: Do not sweep or otherwise disperse into air. Carefully scoop up or vacuum (with appropriate filter) and place in suitable container for disposal.
Large Spills
Containment: Flush with plenty of water to containment area for later disposal. Do not release into sewers or waterways.
Clean up: Damp mop with dilute alkaline solution (sodium bicarbonate, sodium hydroxide, lime)
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed.
Avoid ingestion and inhalation.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: To prevent dispersion of dusts into work area, enclose all processes where possible.
Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations as low as possible. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source. (103)
Administrative Controls: Instruct employees on the proper use of PPE to prevent severe irritation and burns from contact.
Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29ECFR1910.134) and, if necessary, wear a MSHA/NIOSH-approved dust respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.
Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29ECFR1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.
Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.
Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove sulfamic acid from your shoes and clean personal protective equipment.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using sulfamic acid, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance and Odor: White, orthorhombic crystals
Odor Threshold:
Vapor Pressure: 0.006 mm Hg at 68 °F (20 °C)
Vapor Density (Air=1):
Formula Weight: 97.1
Density:
Specific Gravity (H2O=1, at 4 °C): 2.15 g/cc
pH: 1% solution = 1.18 at 77 °F (25 °C)
Water Solubility: 6.5 parts water at 32 °F (0 °C); 2 parts water at 176 °F (80 °C)
Other Solubilities: Sparingly soluble in ethanol and methanol; slightly soluble in acetone; soluble in nitrogenous bases (i.e. ammonia) and nitrogen containing organic solvents (i.e. pyridine, formamide, and dimethylformamide); insoluble in ether, carbon disulfide, and carbon tetrachloride.
Boiling Point: Decomposes @ 205 °C
Freezing/Melting Point: 401 °F (205 °C)

Section 10 - Stability and Reactivity

Stability: Sulfamic acid is stable when dry but it slowly hydrolyzes in solution to form ammonium bisulfate.
Polymerization: Hazardous polymerization does not occur.
Chemical Incompatibilities: Sulfamic acid undergoes a violent or explosive reaction with chlorine, metal nitrates + heat, metal nitrites + heat, and fuming nitric acid.
Conditions to Avoid: Exposure to incompatibles and dispersion of sulfamic acid particulates into air.
Hazardous Decomposition Products: Thermal oxidative decomposition of sulfamic acid can produce nitrogen oxide(s), sulfur oxide(s), and ammonia gas.
Section 11 - Toxicological Information

Toxicity Data:

Eye Effects:
Rabbit, eye: 20 mg caused moderate irritation.
Rabbit, eye: 250 mg/24 hr caused severe irritation.

Skin Effects:
Human, skin: 4% solution applied intermittently for 5 days caused mild irritation.
Rabbit, skin: 500 mg applied for 24 hr caused severe irritation.

Acute Oral Effects:
Rat, oral, LD 50: 3160 mg/kg
Mouse, oral, LD 50: 1312 mg/kg caused altered sleep time (including righting reflex), excitement, and rigidity.

Chronic Effects:
Carcinogenicity:
Mutagenicity:
Teratogenicity:

* See NIOSH, RTECS (WO5950000), for additional toxicity data.

Section 12 - Ecological Information

Ecotoxicity: Data not found
Environmental Fate:
Environmental Degradation:

Section 13 - Disposal Considerations

Disposal: Dilute with water, neutralize with alkaline material (lime, sodium hydroxide, sodium bicarbonate) and flush to sewer with plenty of water. Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

Disposal Regulatory Requirements:
Container Cleaning and Disposal:

Section 14 - Transport Information

Regulated for transportation

US DOT(49 CFR 172.101):
PSN: Sulphamic acid
Hazard Class: 8
UN Number: UN2967
Packing Group: III

IDG
PSN: Sulphamic acid
Hazard Class: 8
UN Number: UN2967
Packing Group: III

IATA
PSN: Sulphamic acid
Hazard Class: 8
UN Number: UN2967
Packing Group: III

IMDG/IMO
PSN: Sulphamic acid
Hazard Class: 8
UN Number: UN2967
Packing Group: III

Section 15 - Regulatory Information

US FEDERAL
TSCA
CAS# 5329-14-6 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA
Section 302 (RQ)
None of the chemicals in this material have an RQ.
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 5329-14-6: acute.
Section 313
Sulfamic Acid

No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA: None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
Sulfamic Acid can be found on the following state right to know lists: New Jersey.
California No Significant Risk Level:
None of the chemicals in this product are listed.
European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols: XI
Risk Phrases:
R 36/38 Irritating to eyes and skin.
Safety Phrases:
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 28A After contact with skin, wash immediately with plenty of water.
WGK (Water Danger/Protection)
CAS# 5329-14-6: 1
Canada
CAS# 5329-14-6 is listed on Canada's DSL/NDSL List.
This product has a WHMIS classification of E.
CAS# 5329-14-6 is not listed on Canada's Ingredient Disclosure List.
Exposure Limits

Section 16 - Other Information

Disclaimer: All information, recommendations and suggestions appearing herein are based upon sources believed to be reliable. However, it is the users responsibility to determine the safety, toxicity and suitability for its own use of this product. WEGO CHEMICAL & MINERAL CORP. DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE USE BY OTHERS OF THIS PRODUCT.