1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Identifier:

Product Name: Aminoinonemethanesulphinic acid
REACH Registration No.: 01-2119980711-35-0000
CAS No.: 1758-73-2
HMRC Tariff No.: 2930 9090

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

Identified use(s): Pulper bleaching of recycled paper; Single stage bleaching of recycled paper; Sequential stage bleaching of recycled paper; Solubilizing Vat dyes; Clearing commercial dyes; Reductive bleaching of minerals (primarily Calcium Carbonate).

Uses advised against: No information given

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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture:

Classification according to Regulation (EC) No 1272/2008[CLP]:
Self-Heating Substances and Mixtures: Category 1; H251
Acute Toxicity – Oral: Category 4: H302
Skin Corrosion / Irritation: Category 2; H315
Eye Damage / Eye Irritation: Category 1; H318
Specific Target Organ Toxicity (Repeated Exposure): Category 2; H373

Xn; R22 - R48/22
Xi; R38 - R41

Additional information: Full text of R-phrase(s)/H-statement(s): see SECTION 16.
Label elements:
Labelling according to Regulation (EC) No 1272/2008[CLP]

Hazard pictogram(s):

Signal Word: Danger

Hazard statement(s):
H251: Self-heating: may catch fire.
H302: Harmful if swallowed.
H315: Causes skin irritation.
H318: Causes serious eye damage.
H373: May cause damage to organs through prolonged or repeated exposure.

Precautionary statement(s):

Prevention: P235+P410: Keep cool. Protect from sunlight.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
Response: P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/physician.

Storage: P407: Maintain air gap between stacks/pallets.

Supplemental Hazard information (EUH): No information available.

Special rules for supplemental label elements for certain mixtures: No information available.

Other hazards: No information available.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>Purity</th>
<th>CAS No.</th>
<th>EINECS No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aminoiminomethanesulphinic acid</td>
<td>&gt; 98.0 % (w/w)</td>
<td>1758-73-2</td>
<td>217-157-8</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES (SYMPTOMS)

Description of first aid measures:

General: In all cases of doubt, or when symptoms persist, seek medical attention.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If symptoms persist, seek medical advice.

Ingestion: The person is conscious and not convulsing, give 2-4 cup fulls of water to dilute the chemical and seek medical attention immediately. Do not inducing vomiting.

[cont...]
Skin contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Seek medical advice if irritation persists.

Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical advice if irritation persists.

Most important symptoms and effects, both acute and delayed: Irritant effects, cough, shortness of breath.

Indication of any immediate medical attention and special treatment needed: Persons with pre-existing skin, eye, or respiratory disease may be at increased risk from the irritant or allergic properties of this material. Attending physician should treat exposed patients symptomatically. Medical treatment: Treat symptomatically and supportively. Treatment may vary with condition of victim and specifics of incident.

5. FIRE-FIGHTING MEASURES

Extinguishing Media
Suitable extinguishing media:
Small fire: Use water spray, dry chemical or carbon dioxide.

Unsuitable extinguishing media: For this substance/mixture no limitations of extinguishing agents are given.

Special hazards arising from the substance or mixture: Ambient fire may liberate hazardous vapours. Fire may cause evolution of: Sulphur oxides, nitrogen oxides.

Advice for fire-fighters: Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing. Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Advice for non-emergency personnel: Avoid substance contact. Avoid inhalation of dusts in all circumstances. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert. Advice for emergency responders: for protective equipment see “Exposure controls / Personal protection equipment”

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and material for containment and cleaning up: Eliminate all sources of ignition. Evacuate unprotected personnel from equipment recommendations. Never exceed any occupational exposure limit. Shovel or sweep material into plastic bags or vented containers for disposal. Do not return spilled or contaminated material to inventory. Flush remaining area with water to remove trace residue and dispose of properly. Avoid direct discharge to sewers and surface waters.

[cont...]
Notify authorities if entry occurs. Do not touch or walk through spilled material. Keep away from combustibles (wood, paper, oils, etc.). Do not return any product to container because of the risk of contamination.

Reference to other sections: See SECTION 7 for information on safe handling. See SECTION 8 for information on personal protection equipment. See SECTION 13 for information on disposal.

7. HANDLING AND STORAGE

Precautions for safe handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Conditions for safe storage, including any incompatibilities: Store in a tightly closed container. Store in a cool (below 30 °C), dry, well-ventilated area away from incompatible substances. Protected from light. Keep locked up or in an area accessible only to qualified or authorised persons. Keep away from heat and sources of ignition.

Specific end use(s): Apart from the uses mentioned in SECTION 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters
Occupational exposure limit values: Not established.
DNEL (Derived No Effect Level) for workers and the general population:
Route Type of effect DNEL: For the worker Inhalation Systemic effect – long term 0.5524 mg/m3 Dermal Systemic effect – long term 0.157 mg/kg bw/day General Population Inhalation Systemic effect – long term 0.136 mg/m3 Dermal Systemic effect – long term 0.078 mg/kg bw/day Oral Systemic effect – long term 0.078 mg/kg bw/day

PNEC (Predicted No Effect Concentration) values:
Compartment PNEC
Water PNEC aqua (freshwater): 32 μg/L PNEC aqua (marine water): 3.2 μg/L PNEC aqua (intermittent releases): 320μg/L
Sediment PNEC sediment (freshwater): 0.116 mg/kg sediment dw PNEC sediment (marine water): 0.0116 mg/kg sediment dw
STP PNEC STP: 1 mg/L
Soil PNEC soil: 4.41 μg/kg soil dw
Air No hazard identified
Secondary poisoning No potential to cause toxic effects if accumulated (in higher organisms) via the food chain.

[cont...]
Exposure controls:
Appropriate engineering controls: General room ventilation is required. Local exhaust ventilation, process enclosures or other engineers controls may be needed to maintain airborne levels below recommended exposure limits. Avoid creating dust or mist. Maintain adequate ventilation. Do not use in closed or confined spaces. Keep levels below exposure limits. To determine exposure levels, monitoring should be performed regularly.

Personal Protective Equipment:
Eye and face protection: Safety goggles or eye protection in combination with breathing protection.
Skin protection: Protective gloves. Protective clothing, rubber boots. Glove material: Nitrile rubber; Glove thickness: 0.11 mm; Break through time: > 480 min.
Respiratory protection: Required when dusts are generated. Recommended Filter type: Filter P 3 (acc. to DIN 3181) for solid and liquid particles of toxic and very toxic substances

Environmental Exposure Controls: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties:
Appearance: Yellowish solid
Odour: Odourless
pH: Not available
Melting Point: 129°C at 101.3 kPa
Flash Point: Decomposes before boiling
Evaporation Rate: Not applicable
Flammability (solid, gas): Non flammable
Upper/Lower Flammability Limit: Not available
Vapour Pressure: 0.36 Pa at 30°C
Relative Density: 1.68 @ 20°C
Water Solubility: 27 g/l at 20°C
Partition Co-efficient: n-octanol/water Log Pow: -3.23 at 20°C
Auto-ignition Temperature: Not available
Decomposition Temperature: 129 – 133°C
Viscosity: Not applicable
Explosive Properties: No explosive properties
Oxidising Properties: No oxidising properties

Other Information: No further information

10. STABILITY AND REACTIVITY

Reactivity: Stable under recommended storage and handling conditions.
SAFETY DATA SHEET
THIOUREA DIOXIDE

Chemical stability: Heat-sensitive, sensitive to moisture.
Possibility of hazardous reactions: No hazardous reactions known.
Conditions to avoid: Incompatible materials. Heat. Exposure to moist air or water.
Incompatible materials: Strong bases, strong oxidizing agents.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects:
Oral, LD50: 1496 mg/kg bw (female rat)
1565 mg/kg bw (male rat) (OECD 401/GLP)
Inhalation, LC50: 164 mg/m³ (OECD 403/GLP)

Acute toxicity:
Dermal, LD50: ≥2000 mg/kg bw (rat) (OECD 402/GLP);
Skin corrosion/irritation: Irritating (author’s own method)
Serious eye damage/irritation: Highly irritating (F. D. A of the United States (Fed. Reg. 28 (119), 5582, 1963); Draize, Kelley
[Drug Cosmet. Industr. 71 (1952) 36]
Respiratory or skin sensitization: Skin sensitisation: Not sensitising (OECD 406, GLP)
Respiratory sensitisation: No study available.
Germ cell mutagenicity: Genetic toxicity: No adverse effect observed (negative).
Carcinogenicity: No information available.
Reproductive toxicity:
NOAEL (parental, systemic toxicity): 47 mg/kg bw/day (OECD 421, GLP)
NOAEL (parental, reproductive performance): 15 mg/kg bw/day (OECD 421, GLP)
STOT-single exposure: No information available.
STOT-repeated exposure: Sub acute NOAEL (rat): 47 mg/kg body weight/day (OECD 407, GLP)
Aspiration hazard: No information available.

12. ECOLOGICAL INFORMATION

Toxicity:
Fish: LC50 = 416 mg/L/96h (Poecilia reticulata)
Daphnia: EC50 = 80.7 mg/L/48h (Daphnia magna)
Algae: EC50 = 32 mg/L/72h (Scenedesmus subspicatus)

Persistence and degradability: The substance is readily biodegradable.
Bioaccumulative potential: The substance has a low potential for bioaccumulation (Log Kow < 3).
Mobility in soil: No information available.

Results of PBT and vPvB assessment: The substance is not a PBT / vPvB substance.
Other adverse effects No information available.

[cont...]

13. DISPOSAL CONSIDERATIONS

Waste treatment methods: Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

14. TRANSPORT INFORMATION

UN Number: UN 3341
UN proper shipping name: THIOUREA DIOXIDE
Transport hazard class(es): 4.2
Packing group: III
Environmental hazards: Non marine pollutant
Special precautions for user: No information available.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: No information available

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture:
EU regulation:
Authorisations: No information available.
Restrictions on use: No information available.
EINECS: CAS# 1758-73-2 is listed.
Listing In Other Inventories: TSCA (USA)
DSL (Canada)
AICS (Australia)
ECL (Korea)
ENCS (Japan)
IECSC (China)

Chemical Safety Assessment: Chemical Safety Assessment has been carried out for this product.

Note: The regulatory information given above only indicates the principal regulations specifically Applicable to the product described in the safety data sheet. The user’s attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

Abbreviations and acronyms: CLP: EU regulation (EC) No 1272/2008 on classification, labelling and packaging of chemical substances and mixtures.
CAS: Chemical Abstracts Service (division of the American Chemical Society).
EINECS: European Inventory of Existing Commercial Chemical Substances.
Key literature references and sources for data: CHEMICAL SAFETY REPORT for aminooiminomethanesulphinic acid

ECHA's public database with information on registered substances

Relevant R-phrases/H-statements:
- R22: Harmful if swallowed.
- R48/22: Harmful: danger of serious damage to health by prolonged exposure if swallowed.
- R38: Irritating to skin.
- R41: Risk of serious damage to eyes.
- H251: Self-heating: may catch fire.
- H302: Harmful if swallowed.
- H315: Causes skin irritation.
- H318: Causes serious eye damage.
- H373: May cause damage to organs through prolonged or repeated exposure.

Legal disclaimer:
The information contained in this SDS does not constitute a risk assessment, and should not replace the user's own assessment of risks as required by other health and safety legislation. This advice is given by Nexchem Ltd who accept no legal liability for it except otherwise provided by law. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.