MATERIAL SAFETY DATA SHEET

1. Chemical Product and Company Identification

Product name: Ammonium Chloride (tablet)
Chemical name: Ammonium Chloride (tablet)
Name of manufacturer:

Section concerned:

Product code: CKC-2620
Contact in emergency: Telephone:
Issued: 28 December 1995 Revised: 1 January 2001

2. Composition, Information on Ingredients

Chemical name (chemical formula) and composition: Ammonium Chloride (NH_4Cl)

Composition	CAS Registry Number	Molecular weight	Reference number in Gazetted List in Japan: Law Concerning the Examination and Regulation of Manufacture etc. of Chemical Substances	Industrial Safety and Health Law	Content	Toxicity
Ammonium Chloride (single component)	12125-02-9	53.49	1-218	Publicly disclosed substance	95% or more	low

Ingredients subject to issue of MSDS (Ammonium Chloride)

Chemical Substance Management Promotion Law (PRTR Law)	Industrial Safety and Health Law	Poisonous and Deleterious Substances Control Law
Not applicable	Listed	Not applicable

3. Hazards Identification

Most serious hazards: Not applicable
Hazards: May cause strong irritation to eyes, low in oral toxicity, however, may cause strong toxicity when injected into blood.
Environmental hazards: Comply with the discharge standards for ammonium ion
Risks: Stable in normal conditions but may be hazardous when mixed with several substances and may be decomposed by strong heating to generate hazardous gas.

4. First Aid Measures

Inhalation: Wash the inside of mouth or nose with water because inhaled dust shows weak-acidic after dissolved in mucus and may irritate mucous membrane.
Skin contact: Wash carefully with water because it may irritate skin after dissolved in sweat.
Eye contact: Wash carefully with plenty of clean water for at least 15 minutues because of its weak-acidity. Seek medical attention if required.

Ingestion:	Ingestion in large amounts may cause nausea, vomiting or acidosis. Give plenty of water to drink immediately for diluting and vomiting, and then seek medical attention.

5. Fire-fighting Measures

Extinguishing agent:	not required (not combustible)
Method:	Heat from fire in surrounding area can cause decomposition and hazardous gas generation. Move to the safest place possible. Spray water to cool if moving is impossible.

6. Accidental Release Measures

Measures for humans:	Do not inhale dust.
Measures for environment:	Rinsed water contains nitrogen. Do not wash away into sewer or river. Follow the disposal considerations.
Cleaning measure:	Sweep up scattered material with a broom and collect it in containers or polyethylene bags. Then wash the area with water.

7. Handling and Storage

Handling:	Wear suitable protective equipment to prevent inhalation. Wash face, hands, mouth, etc., after handling. Handle containers carefully to prevent breakage.
Storage:	Because of its high hygroscopic property, keep away from high temperature and humidity by not placing on the ground directly. Store the containers sealed.

8. Exposure Controls, Personal Protection

Facility requirements:	A place for washing hands should be installed inside workplaces.		
Controlling concentration:	Not applicable		
Tolerance concentration:	Japan Society for Occupational Health (revised in 1996) [1]; Not available ACGIH (revised in 1997) [2]; TWA (8h) 10 mg/m^3 (fume)		
Protective equipment	Respiratory organ:	Breathing protection:	Protective mask
	Hands:	Protective gloves:	Rubber gloves
	Eyes:	Protective glasses:	Safety goggles
	Skin and body:	Wear protective clothes made of material which powder cannot penetrate.	

9. Physical and Chemical Properties

Appearance:	White, granular
Odor:	None
Boiling point:	No boiling point under atmospheric pressure (sublimation pressure 0.101MPa, sublimation point 337.8°C)
Density	1.53
Solubility:	Water; 37.4 g/100 gH_2O (20°C)

	Others; Soluble in alcohols, insoluble in acetone
Vapor pressure:	3.48MPa (520°C)
Point of fusion:	None
Flash point:	Not combustible
Explosive limit:	Not combustible
Oxidizability:	None
Self-reactivity:	None
PH (10% sol.):	6 - 6.5 [3]

10. Stability and Reactivity

Stability/reactivity:	Alkali addition will generate ammonia gas. Reaction will occur radically with NH_4NO_3, BrF_3, IF_7, and $KClO_3$. Heating in the atmosphere may cause decomposition, generating hazardous gases like NO_x, HCl, and NH_3. Reaction with HCN will generate NCl_3, explosive gas. [6]
Materials to avoid:	Copper and copper alloys (brass etc.)
Suitable materials:	Except above-described materials

11. Toxicological Information

Acute toxicity:	LD_{50} (rat oral) 1.65 g/kg [4)5)] LD_{50} (rat intramuscular injection) 30 mg/kg [4)5)] LD_{50} (mouse abdominal) 1,439 mg/kg [4)5)]
Local effects:	No information Ammonium chloride is an acid-forming salt. Ingesting ammonium chloride in large amounts may irritate the stomach and cause nausea and vomiting and may cause metabolic acidosis (acid poisoning that acidifies blood) or diabetic coma. Metabolism: Ammonium chloride dissociates to NH_4^+ and Cl^- in human bodies and Cl^- in plasma increases, being substituted with HCO_3^-. HCO_3^- with H^+ generates CO_2 and H_2O, and CO_2 is discharged via the lungs. Decrease of HCO_3^- may cause metabolic acidosis. Whereas NH_4^+, generated from dissociation, abruptly changes into urea in the liver, leading to an increase of urea concentration in the urine. But no function as ammonia appears. Cl^- transfers Na^+ so strongly that water in cells or among tissues is aspirated into blood, increasing urine and discharging Na^+. [7]
Adverse effects on humans:	Irritancy: Slightly irritant to skin. [Eyes] rabbits 500 mg/24h strongly irritant [4)5)]

12. Ecological Information

Ammonium ion is a nutrition source for plants and can cause excess nutrition in closed water areas. Discharged water flowing into a closed water area shall meet the waste water criteria of the Water Pollution Prevention Law.

13. Disposal Consideration

Comply with the laws on waste disposal and cleaning and entrust to licensed agents. Contaminated containers or packaging must be disposed of in compliance with the relevant laws after brushing off the product.

14. Transport Information

UN classification and UN number for transport of dangerous goods

UN classification:	Not applicable
UN number:	Not applicable

Guidelines for transportation

:
- Be sure not to wet the product because it is highly hygroscopic.
- Refer to "Handling and Storage" and "Accidental Release Measures"

15. Regulatory Information

Industrial Safety and Health Law:	Article 57-2 Cabinet Order 18-2 Appendix 9 Notifiable substance
Water Pollution Prevention Law:	The discharge standard is established for workplaces which discharge 50 m^3/day of waste water into lakes or marshes designated by order of the Prime Minister's Office. *T-N Maximum 120 mg/L Average per day 60 mg/L

16. Other Information

Contact

Section concerned:	Environmental Safety and Quality Control Department
Person concerned:	Manager of Environmental Safety and Quality Control Department
Telephone:	81-836-22-5020 Facsimile: 81-836-22-5016

Literature cited:
1) Occupational Health 34-4, annex (1992)
2) Threshold Limit Values for ACGIH Chemical Substances and Physical Agents; Biological Exposure Indices for Chemical Substances, 1997
3) Measured by Central Chemical Co., Ltd.
4) RTECS (Registry of Toxic Effects of Chemical Substances)
5) Sax's Dangerous Properties of Industrial Materials, 8th Edition, 1992
6) Commentary of the JAPAN'S SPECIFICATIONS AND STANDARDS FOR FOODS AND FOOD ADDITIVES 5th Edition (1987)

Notes

- The content and other physical and chemical properties shown in this MSDS do not imply any guarantee.
- Precautions and other descriptions in this MSDS are for normal handling. Special considerations may be required for particular operations.
- Hazard information in this MSDS is not exhaustive. Other related documents and information should be consulted before using the product.