Issue date: 8/10/2009
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Safety Data Sheet

1. Chemical product and company identification

Product name : AMMONIA WATER 29%

Company information

Name of manufacturer	:	KANTO CHEMICAL CO., INC.
Address	:	2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, Japan
Name of section	:	Electronic materials division technical department
Telephone number	:	+81-3-6214-1080
Facsimile number	:	+81-3-3241-1043
Mail address	:	el-info@kanto.co.jp
Reference No	:	GE00156 1.3
Recommended uses and restrictions	:	Electronic chemicals

2. Hazards identification

GHS classification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Acute toxicity (oral)	Category 4
	Skin corrosion/irritation	Category 1C
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity (single exposure)	Category 1 (central nervous system, respiratory organs)
Environmental hazards	Aquatic acute	Category 3

Hazard pictograms

Signal word : Danger

Hazard statements :
May be corrosive to metals
Harmful if swallowed
Causes severe skin burns and eye damage
Causes damage to organs (central nervous system, respiratory organs)
Harmful to aquatic life

Precautionary statements

Prevention :
Keep only in original container.
Do not breathe mist/vapors.
Wash hands, forearms and face thoroughly after handling.
Do not eat, drink or smoke when using this product.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Response	:	IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. IF SWALLOWED: Rinse mouth. Do not induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water . IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Call a POISON CENTER or doctor. Immediately call a POISON CENTER or doctor. Absorb spillage to prevent material-damage.
Storage	:	Store locked up.
Disposal	:	Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

3. Composition/information on ingredients

Distinction of substance or mixture : Substance

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Ammonium hydroxide	28 - 30	NH4OH	Listed	215-647-6	1336-21-6

＊Concentration : as NH3.

4. First aid measures

First aid measures

First-aid measures after inhalation	:	Remove the victim to fresh air, and make him blow his nose and gargle. If necessary, get medical treatment.
First-aid measures after skin contact	:	Wash the affected areas under running water, get medical treatment as soon as possible.
First-aid measures after eye contact	:	Wash the affected areas under running water for at least 15 minutes. Get medical treatment.
First-aid measures after ingestion	:	Rinse mouth with water. Give the victim one or two glasses of water or milk. Do not induce vomiting. Get medical treatment as soon as possible.
Personal Protection in First Aid and Measures	:	Rescuers should wear proper protective equipment like rubber gloves, goggles.

Most Important Symptoms/Effects

Symptoms/effects	:	Inhalation of high concentration of ammonia gas caused pulmonary edema, and cessation of breathing. Ammonia water has severe irritation and corrosion of skin, and penetrates into deeper tissues. Contact of high concentration of ammonia water with eyes may lead visual disturbance.

5. Fire fighting measures

Suitable extinguishing media	:	Water, dry chemical powder, carbon dioxide, dry sand, foam
Unsuitable extinguishing media	:	None

Fire hazard	:	Ammonia water is incombustible, but igniting air-fuel mixture is produced by releasing ammonia vapor.
Firefighting instructions	:	Move containers from fire area if it can be done without risk, if not possible, apply water from a safe distance to cool and protect surrounding area. Fight fire from windward. Dry chemical powder, carbon dioxide or dry sand should be used for small fires. Foam extinguisher is effective for a large scale fire.
Personal protection (Emergency response)	:	Firefighters should wear protective equipment.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

General measures	:	Wear proper protective equipment and avoid contact with skin and inhalation of vapor. Conduct operations from upwind and evacuate people downwind. Remove all sources of ignition. Keep away personnel except for authorized ones from spillage area by stretching ropes.

Environmental precautions

Environmental precautions	:	Attention should be given to avoid discharge of spilled product into rivers and resulting environmental damage. When diluting spill with large amounts of water, discharge of untreated wastewater into the environment must be avoided.

Methods and Equipment for Containment and Cleaning up

For containment	:	Collect the spillage as much as possible to switable empty container. Neutralize residue with dilute acid and then flush with copious of water.
Prevention Measures for Secondary Accidents	:	Remove nearby sources of ignition and prepare extinguishing media.

7. Handling and storage

Handling

Technical measures	:	Wear proper protective equipment to avoid contact with skin or inhalation of vapor. Pay attention to fire.
Precautions for safe handling	:	Use with an enclosed system or a local exhaust ventilation. Handle in a well-ventilated place. When outdoors, work is done from the windward.

Storage

Storage conditions	:	Store in a dark, cool place and tightly closed.
Material used in packaging/containers	:	Polyethylene, fluorine resin.

8. Exposure controls / Personal protection equipment

ACGIH TWA	25 ppm (as ammonia)
ACGIH STEL	35 ppm (as ammonia)

Appropriate engineering controls : Use with an enclosed system or a local exhaust ventilation.

Protective equipment

Respiratory protection	:	If necessary, wear a chemical cartridge respirator with ammonia gases.
Hand protection	:	Impervious protective gloves
Eye protection	:	Safety goggles
Skin and body protection	:	Protective clothing, protective boots

9. Physical and chemical properties

Physical state	:	Liquid
Color	:	Colorless.
Odor	:	Pungent.
pH	:	Strong alkalinity
Melting point	:	-57.5 ° C
Freezing point	:	No data available
Boiling point	:	37.7 ° C
Flash point	:	No data available
Auto-ignition temperature	:	651 ° C (Ammonia water is incombustible, but igniting air-fuel mixture is produced by releasing ammonia vapor.)
Decomposition temperature	:	No data available
Flammability	:	Non flammable.
Vapor pressure	:	761 hPa (23℃)
Relative density	:	No data available
Density	:	0.90 g/cm^3 (20℃)
Relative gas density	:	0.59
Solubility	:	Water: Miscible. Organic solvents: Soluble in ethanol.
Partition coefficient n-octanol/water (log Pow)	:	No data available
Explosive limits (vol %)	:	16 - 27 vol %
Viscosity, kinematic:	:	No data available
Particle characteristics	:	No data available

10. Stability and reactivity

Reactivity	:	The neutralization reaction with acid produces an ammonium salt. Coordinates to many metal ions to form an ammine complex.
Chemical stability	:	Stable under normal conditions. Absorbs carbon dioxide in the air and produces carbonates.
Possibility of hazardous reactions	:	When heated, it produces harmful ammonia gas. Reacts with halogens and heavy metals to produce explosive substances.
Conditions to avoid	:	Light, heat.
Incompatible materials	:	Acids, oxidizing substances, halogens, metals.
Hazardous decomposition products	:	Nitrogen oxides.

11. Toxicological information

Acute toxicity (oral)	:	Harmful if swallowed rat LD50=350mg/kg (as ammonium hydroxide)

Acute toxicity (dermal)	:	Classification not possible
Acute toxicity (inhalation)	:	No classification (gas) Classification not possible (vapor) Classification not possible (dust, mist)
Skin corrosion/irritation	:	Causes severe skin burns In the skin irritation test with rabbits, there is a report that showed the corrosion by the application of a 20% aqueous solution of ammonium hydroxide. Since ammonium hydroxide is strongly alkaline, and based on the description that it causes corrosion to eyes and skin, it was classified into category 1C.
Serious eye damage/irritation	:	Causes serious eye damage There are descriptions that in the application test of 1mg of ammonium hydroxide to rabbit eye, irritation was noted, and that in the application test of 28.5% aqueous solution to rat eye, irreparable cornea damages such as nebula and opacity, and vascularization were observed. Moreover, there are descriptions that ammonium hydroxide is strongly alkaline and corrosive to eye and skin, and that the substance is strongly irritating to mucosa. Thus, it was classified into category 1.
Respiratory sensitization	:	Classification not possible
Skin sensitization	:	Classification not possible
Germ cell mutagenicity	:	Classification not possible
Carcinogenicity	:	Classification not possible
Reproductive toxicity	:	Classification not possible
STOT-single exposure	:	Causes damage to organs (central nervous system, respiratory organs) Ammonium hydroxide shows respiratory irritation in humans and causes severe irritation and pain of airway mucosa. The substance is also severely corrosive to mouth, throat and stomach on oral route. Inhalation exposure and transdermal exposure usually cause visual damage of directly exposed sites, but severer exposures cause neurological effects, such as elevated blood ammonia levels, seizure, coma, nonspecific diffuse brain damage, muscular weakness, reduced deep tendon reflex and unconsciousness leading to death. Thus, it was classified into category 1 (central nervous system, respiratory organs).
STOT-repeated exposure	:	Classification not possible
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	Harmful to aquatic life Oncorhynchus mykiss LC50=26.8mg/L (pH 8.29) (as ammonium hydroxide)
Aquatic chronic	:	No classification Mysidopsis bahia NOEC=7.1mg/L (ph 7.92-8.01) (as ammonium hydroxide)

Persistence and degradability

Readily biodegradable
Nitrified in water

Bioaccumulative potential

No additional information available

Mobility in soil

No additional information available

Hazardous to the ozone layer

Ozone : Classification not possible

13. Disposal considerations

Ecological waste information : Dilute the chemical with a large amount of water and neutralize with dilute acid, then flush in a drain. Or entrust approved waste disposal companies with the disposal.

Contaminated container and packaging : In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information

International Regulations

Transport by sea(IMDG)

UN-No. (IMDG) : 2672
Proper Shipping Name (IMDG) : AMMONIA SOLUTION
Packing group (IMDG) : III
Transport hazard class(es) (IMDG) : 8

Air transport(IATA)

UN-No. (IATA) : 2672
Proper Shipping Name (IATA) : Ammonia solution
Packing group (IATA) : III
Transport hazard class(es) (IATA) : 8

Marine pollutant : Applicable
MFAG-No : 154

15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

16. Other information

Data sources : Solvents Handbook, T, Asahara el, Kodansha Scientific Ltd. (1976) .
Dangerous Properties of Industrial Materials,6th ed. N.I.Sax Van Nostrand Reinhold Company (1984) .
Handbook of Dangerous Substances Springer-Verlag Tokyo (1991) .
Handbook of 17322 Chemical Products, The Chemical Daily Co. (2022) .
NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation.

The information contained herein is based on several references and the present state of our knowledge. However the SDS does not always cover all information about the product, handle the product carefully.The information is intended to ordinary usage, in case of particular handlings, conduct appropriate safety measurements.The information herein is only provision of information, and it does not represent a guarantee the properties of the product.The Safety Data Sheet(SDS) is prepared based on JIS Z7253.