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Safety Data Sheet

1. Chemical product and company identification

Product name : N-Methylformamide

Company information

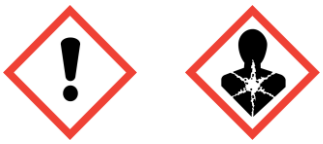
Name of manufacturer	:	KANTO CHEMICAL CO., INC.
Address	:	2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, JP
Name of section	:	Business Administration Department, Reagent Division
Telephone number	:	+81-3-6214-1090
Facsimile number	:	+81-3-3241-1047
Mail address	:	BC32@kanto.co.jp
Reference No	:	25260
Recommended use	:	For research use only
Restrictions on use	:	Seek expert judgment when using the product for applications other than those recommended.

2. Hazards identification

GHS classification

Health hazards	Acute toxicity (dermal)	Category 4
	Serious eye damage/eye irritation	Category 2
	Reproductive toxicity	Category 1B
	Specific target organ toxicity (single exposure)	Category 1 (liver)
	Specific target organ toxicity (repeated exposure)	Category 1 (respiratory organs, liver)

Hazard pictograms



Signal word : Danger

Hazard statements :
Harmful in contact with skin
Causes serious eye irritation
May damage fertility or the unborn child
Causes damage to organs (liver)
Causes damage to organs (respiratory organs, liver) through prolonged or repeated exposure

Precautionary statements

Prevention :
Do not handle until all safety precautions have been read and understood.
Do not breathe mist, vapors.
Wash hands, forearms and face thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wear protective gloves/protective clothing/eye protection/face protection.

Response	:	IF ON SKIN: Wash with plenty of water. 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. IF exposed or concerned: Get medical advice/attention. Call a POISON CENTER or doctor if you feel unwell. Get medical advice/attention if you feel unwell. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.
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
N-Methylformamide	≥ 99	C2H5NO	Listed	204-624-6	123-39-7

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.
First-aid measures after eye contact	:	Wash the affected areas under running water for at least 15 minutes. If necessary, get medical treatment.
First-aid measures after ingestion	:	Give the victim water or salt water and make him vomit. Get medical attention.
Personal Protection in First Aid and Measures	:	Rescuers should wear proper protective equipment like rubber gloves, goggles.

5. Fire fighting measures

Suitable extinguishing media	:	Water, dry chemical powder, carbon dioxide, dry sand, alcohol resistant foam
Unsuitable extinguishing media	:	Foam extinguisher
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. Alcohol-resistant foam extinguisher is effective for a large scale fire.
Personal protection (Emergency response)	:	Wear breathing apparatus.

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. 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 : Absorb spill with inert material (e.g, diatomaceous earth, sand) and flush spillage area with copious amounts 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. Fire is strictly prohibited.
Ventilate well at working places.

Precautions for safe handling : Use with an enclosed system or a local exhaust ventilation. Use in well-ventilated areas.
Do not allow contact with oxidizing substances.

Storage

Storage conditions : Store in a dark, cool place and tightly closed.

Material used in packaging/containers : Glass, fluorine resin, stainless steel.
Do not use polyvinyl chloride resin, polystyrene.

8. Exposure controls / Personal protection equipment

ACGIH TWA	1 ppm
Remark (ACGIH)	Skin

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

Protective equipment

Respiratory protection : Chemical cartridge respirator with an organic vapor cartage or airline respirator

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 - pale yellow

Odor	:	Slight amine odor
pH	:	No data available
Melting point	:	-3 ° C
Freezing point	:	No data available
Boiling point	:	182.5 ° C
Flash point	:	98 ° C (C.C.)
Auto-ignition temperature	:	425 ° C
Decomposition temperature	:	No data available
Flammability	:	Flammable
Vapor pressure	:	33.7 Pa (25℃)
Relative density	:	No data available
Density	:	1.001 - 1.006 g/cm³ (20℃)
Relative gas density	:	2.04
Solubility	:	Water: Miscible. Organic solvents: Very soluble in acetone, ethanol. Insoluble in ether.
Partition coefficient n-octanol/water (log Pow)	:	-0.87 (25℃)
Explosive limits (vol %)	:	No data available
Viscosity, kinematic	:	1.73 mm²/s (25℃)
Particle characteristics	:	No data available

10. Stability and reactivity

Reactivity	:	May react with oxidizing substances.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Stable under normal conditions of use.
Conditions to avoid	:	Light, heat.
Incompatible materials	:	Oxidizing substances.
Hazardous decomposition products	:	Carbon monoxide, nitrogen oxides.

11. Toxicological information

Acute toxicity (oral)	:	No classification rat LD50=4000 mg/kg
Acute toxicity (dermal)	:	Harmful in contact with skin rabbit LD50=1289 mg/kg
Acute toxicity (inhalation)	:	No classification (gas) Classification not possible (vapor) Classification not possible (dust, mist)
Skin corrosion/irritation	:	Classification not possible
Serious eye damage/irritation	:	Causes serious eye irritation There is a report that in an eye irritation test (n=6) with rabbits, in which this substance was applied, a conjunctival redness score at 24, 48, and 72 hours after application was 2.13, and the animals did not recover completely in 4 days. Therefore, it was classified as category 2.
Respiratory sensitization	:	Classification not possible
Skin sensitization	:	Classification not possible

Germ cell mutagenicity	:	No classification As for in vivo, it was negative in a mouse dominant lethal test. As for in vitro, it was negative in a bacterial reverse mutation test. Therefore, it was classified as "No classification".
Carcinogenicity	:	Classification not possible
Reproductive toxicity	:	May damage fertility or the unborn child In a developmental toxicity test with rats exposed by inhalation on gestational day 7-16, increased embryo resorptions, decreased litter size, decreased pup body weights, etc. were observed significantly at 150 ppm. In addition, increased malformations such as head cysts, microphthalmia, hydrocephaly are reported. A significantly decreased pup body weight was observed at 50 ppm. In a developmental toxicity test with rats dosed by gavage on gestational day 6-15, no clear maternal toxicity was observed at up to 200 mg/kg/day of the highest dose. In fetuses, however, at 67 mg/kg/day of the middle dose, a decrease in fetal body weight and length, and increased variations (unknown details) and malformations (incidence: 51%, meningocele, malformations of ribs and vertebral column, etc.) were observed. At 200 mg/kg/day, 99.6% of implants were resorbed in the early stage, and in survival fetuses, malformations such as exencephaly and visceral ectopia were observed in one animal. In developmental toxicity tests with rats by the oral and inhalation routes, developmental effects including an increase in the incidence of malformations were observed at or below doses where the maternal toxicity was manifested. Therefore, it was classified in category 1B.
STOT-single exposure	:	Causes damage to organs (liver) There is a report that the primary target organ in relation to acute toxicity of this substance in humans is the liver. There is a report that in humans, in the case of a single oral exposure to up to the upper limit of 15 mg/kg, at not much higher doses, nausea, vomiting and liver dysfunction were observed. Therefore, it was classified in category 1 (liver).
STOT-repeated exposure	:	Causes damage to organs (respiratory organs, liver) through prolonged or repeated exposure In a case of multiple patients orally administered at doses of 100-4000 mg/kg for 2-36 days, hepatic damage was observed in all patients (total doses: 80-870 mg). Necropsy of one patient revealed irregular destruction of lobular tissue, large-sized hepatocytes, and existence of an area of liver regeneration in the liver. There is a report that in a 2-week inhalation test with rats, wheezing and rales were observed at or above 50 ppm (0.12 mg/L, converted guidance value: 0.013 mg/L, within the range of category 1). Therefore, it was classified in category 1 (respiratory organs, liver).
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	No classification Oryzias latipes LC50>100 mg/L/96h
Aquatic chronic	:	No classification Daphnia magna NOEC>100 mg/L/21-day

Persistence and degradability

No additional information available

Bioaccumulative potential

Low bioconcentration
log Pow : -0.87

Mobility in soil

No additional information available

Hazardous to the ozone layer

Ozone : Classification not possible

13. Disposal considerations

Ecological waste information : Burn in a chemical incinerator equipped with an afterburner and a scrubber. 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) : Not applicable
Proper Shipping Name (IMDG) : Not applicable
Packing group (IMDG) : Not applicable
Transport hazard class(es) (IMDG) : Not applicable

Air transport(IATA)

UN-No. (IATA) : Not applicable
Proper Shipping Name (IATA) : Not applicable
Packing group (IATA) : Not applicable
Transport hazard class(es) (IATA) : Not applicable

Marine pollutant : Not applicable

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) .
Dictionary of Organic Compounds, The society of Synthetic Organic Chemistry, Kodansha Ltd. (1985) .
ICSC Card (2009) .
NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation.
ECHA (European Chemicals Agency).

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.