SAFETY DATA SHEETS

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Sixth revised edition

Version: 1.0

Creation Date: Aug 10, 2017

Revision Date: Aug 10, 2017

1. Identification

1.1 GHS Product identifier

Product name	2-methylpyridine

1.2 Other means of identification

Product number	-
Other names	2-Methylpyridine

1.3 Recommended use of the chemical and restrictions on use

Identified uses	For industry use only. Food additives -> Flavoring Agents
Uses advised against	no data available

2. Hazard identification

2.1 Classification of the substance or mixture

Flammable liquids, Category 3

Acute toxicity - Oral, Category 4

Acute toxicity - Dermal, Category 4

Eye irritation, Category 2

Acute toxicity - Inhalation, Category 4

Specific target organ toxicity – single exposure, Category 3

2.2 GHS label elements, including precautionary statements

Pictogram(s)

Signal word

Warning

Hazard statement(s)

H226 Flammable liquid and vapour

H302 Harmful if swallowed

H312 Harmful in contact with skin

H319 Causes serious eye irritation

H332 Harmful if inhaled

H335 May cause respiratory irritation

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233 Keep container tightly closed.

P240 Ground and bond container and receiving equipment.

P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.

P242 Use non-sparking tools.

P243 Take action to prevent static discharges.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P271 Use only outdoors or in a well-ventilated area.

Response	P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
	P370+P378 In case of fire: Use ... to extinguish.
	P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/…if you feel unwell.
	P330 Rinse mouth.
	P302+P352 IF ON SKIN: Wash with plenty of water/...
	P312 Call a POISON CENTER/doctor/…if you feel unwell.
	P321 Specific treatment (see ... on this label).
	P362+P364 Take off contaminated clothing and wash it before reuse.
	P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P337+P313 If eye irritation persists: Get medical advice/attention.
	P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Storage	P403+P235 Store in a well-ventilated place. Keep cool.
	P403+P233 Store in a well-ventilated place. Keep container tightly closed.
	P405 Store locked up.
Disposal	P501 Dispose of contents/container to ...

2.3 Other hazards which do not result in classification

none

---

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
2-methylpyridine	2-methylpyridine	109-06-8	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Refer for medical attention.

In case of skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

In case of eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

If swallowed

Rinse mouth. Do NOT induce vomiting. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

INHALATION, INGESTION OR SKIN ABSORPTION: Narcosis, headache, nausea, giddiness, vomiting. EYES: Severe irritation. SKIN: Causes burns. INGESTION: Irritation and gastric upset. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

/SRP:/ Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with

gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Aromatic hydrocarbons and related compounds/

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

To fight fire, use carbon dioxide, dry chemical.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: When heated to decompo- sition, emits toxic fumes of cyanide. Behavior in Fire: Heat may cause pressure buildup in closed containers. Use water to keep container cool. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Personal protection: chemical protection suit including self-contained breathing apparatus.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use.Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Separated from oxidants.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique(without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and

dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state	colourless to yellow liquid with an unpleasant smell
Colour	Colorless liquid
Odour	Strong unpleasant odor
Melting point/ freezing point	50°C(lit.)
Boiling point or initial boiling point and boiling range	128-129°C(lit.)
Flammability	Flammable. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit / flammability limit	no data available
Flash point	29°C
Auto-ignition temperature	535°C
Decomposition temperature	no data available
pH	/SRP/: Weak base
Kinematic viscosity	no data available
Solubility	In water:MISCIBLE
Partition coefficient n-octanol/water (log value)	log Kow = 1.11
Vapour pressure	10 mm Hg (24.4 °C)
Density and/or relative density	0.943g/mLat 25°C(lit.)
Relative vapour density	3.2 (vs air)
Particle characteristics	no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

2-Methylpyridine is highly stable in aqueous solns ... .

10.3 Possibility of hazardous reactions

Moderate fire risk2-METHYLPYRIDINE is hygroscopic. This compound reacts with hydrogen peroxide, iron(II) sulfate, sulfuric acid, oxidizing agents, acids, and metals.

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Mixtures with hydrogen peroxide + iron(II)sulfate + sulfuric acid may ignite & then explode.

10.6 Hazardous decomposition products

When heated to decomp, emits toxic fumes of /nitrogen oxides. /

11. Toxicological information

Acute toxicity

- Oral: LD50 Rat oral 790 mg/kg
- Inhalation: no data available
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

- Toxicity to fish: LC50; Species: Pimephales promelas (fathead minnow); Conditions: flow-through bioassay with measured concentrations, 25.6°C, dissolved oxygen 7.0 mg/L, hardness 46.0 mg/L CaCO3, alkalinity 309 mg/L CaCO3, and pH 7.88; Concentration: 897 mg/L for 96 hr (confidence limit not reliable)
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: 2-Methylpyridine was reported as readily biodegradable in the MITI test(1). In an aerobic screening test using an enrichment culture obtained from soil as an inoculum, 100% degradation was obtained in 14 to 32 days(2). When this test was repeated under anaerobic conditions, degradation was much

slower, requiring >97 days for complete biodegradation(2). Only 2.7% of the added 2-methylpyridine (initial concentration of 2 umoles/g) remained after 16 days following incubation in a silt loam soil(3). Complete biodegradation of 2-methylpyridine, initially added at 4 mg/L, was reported in aerobic groundwater incubated at 15°C for 4 days(4). In an aerobic column study where subsurface sediment was leached with contaminated groundwater, 65% of the initially applied 2-methylpyridine was removed after 5 weeks of operation(5). Complete biodegradation of 2-methylpyridine was observed in 24 days following incubation in a defined medium inoculated with soil(6). Contaminated groundwater, from the American Creosote Works Superfund site in Pensacola, FL, was incubated with 2-methylpyridine; 33, 33, 33, 66, and 100% degradation was reported after incubation for 1, 3, 5, 8, and 14 days, respectively(7). 2-Methylpyridine, present at 100 mg/L, reached 0.1% of its theoretical BOD in 4 weeks using an activated sludge inoculum at 30 mg/L in the Japanese MITI test(8).

12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated for 2-methylpyridine(SRC), using a log Kow of 1.11(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC). Low bioconcentration was reported for tests using carp (Cyprinus carpio)(4); however, actual BCF values were not available(SRC).

12.4 Mobility in soil

The sorption behavior of 2-methylpyridine was studied in soil column tests using 5 Eurosoil reference soils having organic carbon content ranging from 0.33-1.85% and pH ranging from 5.2-8.6(1); measured Kd values ranging from 0.08 to 6.52(1) correspond to calculated Koc values of 4, 38, 70, 100 and 215(SRC); the lowest Koc value of 4 corresponds to Eurosoil 2 which had the highest pH value(8.6). The pKa of 2-methylpyridine is 5.96(2), indicating that this compound will exist partially in cation form in the environment and cations generally adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts(3). In the Eurosoil column tests(1), lowest adsorption occurred when 2-methylpyridine was in non-ionized form(1). Sorption of 2-methylpyridine to soil is primarily controlled by cation exchange and surface complex formation(1,4). According to a classification scheme(5), the Koc values suggest that 2-methylpyridine is expected to have very high to moderate mobility in soil.

12.5 Other adverse effects

no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: UN2313 IMDG: UN2313 IATA: UN2313

14.2 UN Proper Shipping Name

ADR/RID: PICOLINES
IMDG: PICOLINES
IATA: PICOLINES

14.3 Transport hazard class(es)

ADR/RID: 3 IMDG: 3 IATA: 3

14.4 Packing group, if applicable

ADR/RID: III IMDG: III IATA: III

14.5 Environmental hazards

ADR/RID: no IMDG: no IATA: no

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15. Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
2-methylpyridine	2-methylpyridine	109-06-8	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Not Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

16. Other information

Information on revision

Creation Date	Aug 10, 2017
Revision Date	Aug 10, 2017

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
- HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
- IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
- ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg
- Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp
- ECHA - European Chemicals Agency, website: https://echa.europa.eu/
