

## 3-METHYL PYRIDINE

CAS No: 108-99-6 UN No: 2313  
 F- Flammable, T – Toxic, C - Corrosive,  
 N – Dangerous to Environment  
 R10, R20/21/22, R34, R36, R38  
 S16 S20/21 S24/25 S26 S36/37/39 S45

## EVAPORATOR/FLOATER



## KEY POINTS

- Colourless liquid with strong sweet odour.
- Heavier than air. Dissolves in water.
- Highly flammable liquid, toxic and corrosive by ingestion, inhalation and skin contact.
- Incompatible with oxidising substances, acids, isocyanate, halogenated organics, phenols, acid halides.
- Minor exposures may result in irritation of the eyes and respiratory tract. Moderate exposure may cause breathing difficulties, nausea, weakness, CNS depression. Acute exposure to skin, eyes or ingestion may cause severe burns. Repeated exposure may lead to defatting of skin, liver and kidney damage.
- Exposure to high concentrations may be potentially **fatal**.

HUMAN HEALTH EXPOSURE ROUTES See Section 3

- Exposure by any route may be dangerous. Secondary contamination may occur.
- Inhalation may lead to irritation and CNS effects
- Dermal exposure may cause deep burns.
- Ocular exposure may lead to burns and damage.
- Ingestion may result in burns of mouth and throat

ENVIRONMENT See section 11

- Volatilises from soil and water,
- Readily dissolves in water
- Degrades rapidly in all media
- Does not bioaccumulate

FIRE See Section 8

- Highly flammable.
- Emits toxic gases (CN, CO, NOx).
- May accumulate in voids.
- Protective clothing and breathing apparatus

## MARITIME TRANSPORT

- Transported as liquefied gas or solutions

## REACTIVITY WITH SEA WATER

- Dissolves in water.

## INCIDENT MANAGEMENT

- Alert Emergency Services.
- Non-essential personnel should move at least 50 m away from the incident.
- There may be a public safety hazard outside the immediate area of the incident (See Table 1). Consider evacuation/shelter and set up of emergency rest centres for evacuees.
- Initiate real-time ambient monitoring, for use with meteorological and marine forecasts.
- Emergency department staff treating chemically contaminated casualties should be equipped with approved, gas-tight decontamination suits and breathing apparatus. Ventillate enclosed spaces.
- Secondary contamination unlikely from exposure to gas but may occur from solutions / liquid ammonia.
- Decontamination run-off should be prevented from entering drains and watercourses. Treat spills with dry-lime or soda ash or sand for spills.
- Risk Communication strategy to advise members of the public on evacuation/sheltering
- Post-incident epidemiology / follow-up. Medical referrals.
- Biomarkers for heterocyclic aromatic amines include measurement in urine, breath and hair.

### 3-METHYL PYRIDINE EVAPORATOR/FLOATER

#### HUMAN HEALTH CONSIDERATIONS – See Section 3 to 6

##### ERG 2008 Table 1: Initial isolation and protective action distances

Chemical Name	Spill Size	Definition	Isolation Zone in all directions	DownWind Protection Zone	
				Day	Night
3-methyl pyridine	Small	From small package or small leak from large package	50m (150ft)	50m (150ft)	50m (150ft)
	Large	From a large package or from many small packages	300m (900ft)	300m (900ft)	300m (900ft)
	Fire	If substance involved in fire	800 meters (1/2 mile)	consider evacuation for that distance in all directions	

**Isolation Distance:** All personnel to be directed in a cross wind direction this distance from the spill

**Protective Action Zone:** A square area down wind of the spill where protective action should be considered, starting with nearest receptors and working away from spill.

Such estimates should always be regarded with reservations and never be alternatives for monitoring.

##### Acute Health Hazards

ppm	mg m <sup>-3</sup>	Signs and symptoms
<1	<3	Detectable (Pyridine)
10	40	Objectionable (Pyridine)
6 - 12	23 to 50	CNS effects

##### Monitoring Strategy (Short & Long Term) & Equipment – See Section 6

<b>Health and Safety</b>	Air - Real-time electrochemical or photionisation detection.
<b>Environmental</b>	Atmospheric fate and transport e.g. Aloha (immediate risk / first response), Calpuff (longer term)
<b>Public Health</b>	GP referrals, hospital admissions – numbers, symptomology, follow-up studies. (See Biomarkers)

#### OPERATIONAL EMERGENCY RESPONSE – See Sections 8 & 9

<b>Fire fighting measures</b>	Use CO <sub>2</sub> or dry powder chemical extinguishers for small fires, foam for large fires.
<b>Decontamination of responders</b>	Decontamination should be performed using local protocols in designated areas with adequate ventilation. Run-off should be contained and disposed of at an appropriate waste facility.
<b>Response &amp; Clean up</b>	Protect sensitive water courses, do not allow run-off to enter drains. Ventilate confined spaces. Will not persist in the environment.
<b>Waste Management</b>	Dispose as hazardous waste. Treat spills with Use dry-lime or soda ash or sand for spills. Wash contaminated clothing thoroughly before re-use.

#### EMERGENCY CONTACTS

ORGANISATION	TELEPHONE
FIRE, AMBULANCE, POLICE	999
HEALTH PROTECTION AGENCY: Chemical Hazards Unit	08448 920555
ENVIRONMENT AGENCY: 24/7 Pollution	0800 807060

## Summary Page

## 3-METHYL PYRIDINE

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## SECTION 1: IDENTIFICATION

<b>NAME:</b>	3-Methyl Pyridine	<b>CHEMICAL FORMULA:</b>	C <sub>6</sub> H <sub>7</sub> N		
<b>SYNONYMS:</b>	3-Picoline, beta-Picoline				
<b>CAS No:</b>	108-99-6	<b>UN No:</b>	2313	<b>EINECS :</b>	203-636-9
<b>CLASSIFICATIONS</b>	F – Flammable, T – Toxic, C – Corrosive,				
<b>RISK PHRASES</b>	R10 Flammable R20/21/22 Harmful by inhalation, in contact with skin and if swallowed. R34 Causes burns R36 / 37 /R38 Irritating to eyes, respiratory system and skin				
<b>SAFETY PHRASES</b>	S16 - Keep away from sources of ignition - No Smoking. S20/21 - When using do not eat, drink or smoke. S24/25 - Avoid contact with skin and eyes. S26 - Contact with eyes, rinse immediately with water seek medical advice. S36/37/39-Wear suitable clothing, gloves and eye/face protection. S 45 - In case of accident or if you feel unwell seek medical advice immediately.				
<b>USES:</b>	3-methyl pyridine is used as a solvent and as an intermediate in production of dyes and resins and many other industrial chemicals. Estimated annual manufacture in US 1998 was 9000 - 13000 tonnes. Estimated UK trade 2007 greater than 10,000 tonnes per annum. Typically transported as a refrigerated liquid.				

## SECTION 2: PHYSICAL CHEMICAL PROPERTIES

<b>SEBC CLASSIFICATION</b>	Evaporator / Dissolver	<b>BOILING POINT</b>	143 °C
<b>APPEARANCE</b>	Clear liquid	<b>VAPOUR PRESSURE</b>	0.6 kPa at 20 °C
<b>ODOUR</b>	Strong unpleasant odour	<b>SPECIFIC GRAVITY</b> (air = 1):	3.21 at 21 °C
<b>FLAMMABILITY</b>	Highly flammable	<b>SOLUBILITY IN WATER</b>	Miscible at 15 °C
<b>STABILITY &amp; REACTIVITY</b>	Reacts with oxidisers and acids. Incompatible with isocyanates,halogenated organics. Peroxides,epoxides, anhydrides, acid halides, phenols.  Emits hydrogen gas on reaction with hydrides. Can generate CO, NOx and cyanide during combustion.		

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**SECTION 3: HUMAN HEALTH HAZARDS**


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Following exposure to any chemical, the adverse health effects you may encounter depend on several factors, including the amount to which you are exposed (dose), the way you are exposed, the duration of exposure, the form of the chemical and if you were exposed to any other chemicals.

**ROUTES OF ENTRY:** Exposure by any route may be dangerous.

**POTENTIAL HEALTH EFFECTS**

<b>INHALATION</b>	Inhalation causes irritation of eyes, nose and throat. Vomiting, headache and dizziness have been reported. Inhalation may lead to CNS effects, Unconsciousness, Weakness.
<b>EYES</b>	Ocular exposure may result in pain, blurred vision. Severe deep burns.
<b>SKIN</b>	May be absorbed through skin. Dermal exposure causes irritation, photosensitisation and contact dermatitis. Prolonged contact may lead to systemic toxicity.
<b>INGESTION</b>	Ingestion causes nausea, vomiting, abdominal pain, diarrhoea, headache, vertigo and pulmonary oedema.

**ACUTE HEALTH HAZARDS:** Vapours are severe respiratory tract irritants. High concentrations may lead to unconsciousness Concentrated solutions or vapours may cause severe, penetrating dermal burns. Vapour and liquids may cause eye irritation. Ingestion may cause buens, nausea and vomiting, diarrhoea. Liquids and vapours may be absorbed through skin.

ppm	mg m <sup>-3</sup>	Signs and symptoms
<1	<3	Detectable (Pyridine)
10	40	Objectionable (Pyridine)
6 - 12	23 to 50	CNS effects

**CHRONIC HEALTH HAZARDS:** Prolonged exposure may lead to defatting of skin, liver and kidney damage, CNS effects.

**CARCINOGENICITY:** Non Carcinogen. No reported reproductive or teratogenic effects.

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## SECTION 4: EXPOSURE GUIDELINES AND STANDARDS

ODOUR THRESHOLD: -  
 TASTE THRESHOLD: -

EU AIR QUALITY GUIDELINE: No guideline value specified

DRINKING WATER QUALITY GUIDELINE (UK DWI 2000) No guideline value specified

WORKPLACE EXPOSURE LIMITS (American Industrial Hygiene) 2 ppm (6 mg m<sup>-3</sup>) (8 hour reference period)  
 5 ppm (20 mg m<sup>-3</sup>) (15 min reference period)

EMERGENCY RESPONSE PLANNING GUIDELINE (ERPG) VALUES  
 (American Industrial Hygiene Association)

	Listed value (ppm)	Calculated value (mg m <sup>-3</sup> )
ERPG-1*	Not Listed	Not Listed
ERPG-2*	Not Listed	Not Listed
ERPG-3*	Not Listed	Not Listed

ACUTE EXPOSURE GUIDELINE LEVELS (AEGLS) (U.S. Environmental Protection Agency)

	ppm				
	10 min	30 min	60 min	4 hr	8 hr
AEGL-1†	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
AEGL-2††	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
AEGL-3†††	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

TEELs (Temporary Level of concern) (U.S. Department of Energy)

designed to represent the predicted response of members of the general public to different concentrations of a chemical during an incident.

TEEL 1: 5 ppm	- irritation and other minor effects
TEEL 2: 125 ppm	- irritating but reversible effects
TEEL 3: 600 ppm	- serious impact, perhaps death of compromised individuals

Reference USEPA CAMEO

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**SECTION 5: EXPOSURE CONTROLS / PERSONAL PROTECTION**


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**CONTROLS:**

- Use fine water spray.
- Spillages and decontamination run-off should be prevented from entering sensitive watercourses. Solutions and vapours are flammable.

**PERSONAL PROTECTIVE EQUIPMENT**

<b>EMERGENCY ACTION CODE</b>	EAC •2W
<b>RESPIRATORY PROTECTION</b>	Breathing apparatus ( <i>BS EN 137</i> )
<b>EYE PROTECTION</b>	Chemical resistant goggles ( <i>BS EN166</i> )
<b>SKIN PROTECTION</b>	Liquid-tight chemical protective clothing ( <i>BS 8428</i> )
<b>EMERGENCY RESPONDERS</b>	Ambulance staff, paramedics and emergency department staff treating chemically contaminated casualties should be equipped with approved, gas-tight decontamination suits based on EN466:1995, EN12941:1998 and prEN943-1:2001, where appropriate with breathing apparatus( <i>BS EN 137</i> ).
<b>OTHER PROTECTIVE CLOTHING OR EQUIPMENT</b>	<b>APP A(fl)</b> flammable liquid.

**WORK HYGIENIC PRACTICES:**

Decontamination should be performed using local protocols in designated areas such as a decontamination cubicle with adequate ventilation.

Secondary contamination is possible. Wash skin with soapy water for 10 – 15 minutes.

**DECONTAMINATION OF RESPONDERS:**

Decontamination should be performed using local protocols in designated areas such as a decontamination cubicle with adequate ventilation. Wash skin with water for 10 – 15 minutes.

**NON ESSENTIAL PERSONNEL / PUBLIC**

There may be a public safety hazard outside the immediate area of the incident. People should stay indoors with windows and doors closed, ignition sources should be eliminated and ventilation stopped.

Non-essential personnel should move at least 50 m away from the incident.

Risk communication via news media as well as internet / telephone advice lines should be initiated to inform local residents / public based upon forecast data or Table 1 estimates.

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## SECTION 6: MONITORING AND DETECTION

**NOTE: HIGHLY FLAMMABLE – AVOID IGNITION SOURCES AND USE INTRINSICALLY SAFE MONITORS**

## HEALTH AND SAFETY

- Use real-time monitoring by electrochemical sensors or photoionisation detector (PID).
- Note PID is non compound specific so will detect other volatile contaminants in addition to ammonia.
- Monitor for asphyxiant atmospheres (oxygen depletion) before entering confined spaces. Ammonia is lighter than air so will accumulate less in poorly ventilated areas, voids and other confined spaces.
- Use colorimetric quantitative kits or electrochemical probes for aqueous liquids.

## ENVIRONMENTAL HEALTH

- Chemical does not persist in the environment. Volatile and soluble in water.
- Fire and explosion may lead to particulates and other contaminants including cyanide, oxides of nitrogen and carbon monoxide.
- Use monitoring data, marine and meteorological data to predict gas cloud / smoke plume movement using appropriate modeling software e.g. Aloha (immediate risk / first response), CALPUFF (longer term).
- In the absence of data refer to Table 1 below for potential isolation and protective distances

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	Fire	If substance involved in fire	800 meters (1/2 mile)	consider evacuation for that distance in all directions	

**Isolation Distance:** All personnel to be directed in a cross wind direction this distance from the spill

**Protective Action Zone:** A square area down wind of the spill where protective action should be considered, starting with nearest receptors and working away from spill.



**Such estimates should always be regarded with reservations and never be alternatives for monitoring.**

## PUBLIC HEALTH FOLLOW-UP &amp; EPIDEMIOLOGY

- Collate GP referrals, hospital admissions – numbers, symptomology, age, sex, pre-existing conditions
- Biomarkers for heterocyclic aromatic amines include measurement in urine, breath and hair. (USEPA)
- Follow-up studies where public health may have been impacted (see chronic effects Section 3)

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**SECTION 7: FIRST AID MEASURES**

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**Important Notes**

- Avoid sources of ignition
- Ambulance staff, paramedics and emergency department staff treating chemically contaminated casualties should be equipped with Department of Health approved, gas-tight (Respirex) decontamination suits based on EN466:1995, EN12941:1998 and prEN943-1:2001, where appropriate.
- Decontamination should be performed using local protocols in designated areas such as a decontamination cubicle with adequate ventilation.
- Secondary contamination may occur.

**Dermal exposure**

- Remove patient from exposure.
- The patient should remove all clothing and personal effects.
- Double-bag soiled clothing and place in a sealed container clearly labelled as a biohazard, in well ventilated area.
- Gently blot away all adherent liquid from patient.
- Wash hair and all contaminated skin with copious amounts of water (preferably warm) and soap for at least 10-15 minutes.
- Decontaminate open wounds first and avoid contamination of unexposed skin.
- Pay special attention to skin folds, axillae, ears, fingernails, genital areas and feet.
- Cover affected area with a clean non-adherent dressing.

**Ocular exposure**

- Remove patient from exposure.
- Remove contact lenses if necessary and immediately irrigate the affected eye thoroughly with water or 0.9% saline for at least 10-15 minutes.
- Patients with corneal damage or those whose symptoms do not resolve rapidly should be referred for urgent ophthalmological assessment.

**Inhalation**

- Remove patient from exposure. Ensure a clear airway and adequate ventilation.
- Give oxygen to patients with respiratory symptoms.
- Apply other supportive measures as indicated by the patient's clinical condition.

**Ingestion**

- Ensure a clear airway and adequate ventilation.
- Give oxygen to symptomatic patients.
- Apply other measures as indicated by the patient's clinical condition.

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### SECTION 8: FIRE FIGHTING MEASURES

Reacts with oxidisers and acids. Incompatible with isocyanates, halogenated organics. Peroxides, epoxides, anhydrides, acid halides, phenols. Reacts with hydrides to generate hydrogen gas.

**FLAMMABILITY:** Highly flammable liquid and vapour.

**LOWER EXPLOSIVE LIMIT:** 1.3%

**UPPER EXPLOSIVE LIMIT:** 8.7%

**EXTINGUISHING MEDIA:** Small fire – Dry chemical or CO2 extinguisher. Large fires – alcohol resistant foam.

**SPECIAL FIRE FIGHTING PROCEDURES:** Spillages and decontamination run-off may be flammable. Avoid run-off entering drains. May form explosive atmospheres.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Dissolves in water.

Emits toxic fumes of cyanide, carbon monoxide and oxides of nitrogen when heated to decomposition

### SECTION 9: RECOVERY RESPONSE AND CLEAN-UP



**Special precautions:** Reacts with oxidisers and acids. Incompatible with isocyanates, halogenated organics. Peroxides, epoxides, anhydrides, acid halides, phenols. Reacts with hydrides to generate hydrogen gas.

#### INCIDENT MANAGEMENT & RESPONSE

- Use fine water spray to control migration of vapors.
- Avoid run-off entering sensitive water-courses.
- There may be a public safety hazard outside the immediate area of the incident. People should stay indoors with windows and doors closed, ignition sources should be eliminated and ventilation stopped.
- Non-essential personnel should move at least 50 m away from the incident.

#### CLEAN-UP/RECOVERY

- Aqueous solutions may be able to be contained and collected.
- Chemical is volatile and highly soluble in water. It will not persist in the environment or bioaccumulate.
- Treat spills with dry-lime or soda ash or sand for spills. Absorb with sand or inert materials.

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## SECTION 10: WASTE DISPOSAL

WASTE CATALOGUE CLASSIFICATION : 28-05-08 inorganic chemicals, gases

WASTE DISPOSAL METHOD	Volatile and non persistent Dissolves in water. Use dry-lime or soda ash or sand for spills.
ENVIRONMENTAL	Volatile and non persistent Dissolves in water. Use dry-lime or soda ash or sand for spills.
PATIENT CLOTHING	Double-bag soiled clothing and place in a sealed container clearly labelled as a biohazard. Wash soiled clothing thoroughly if not to be disposed as waste.

**Handling & Storage:** Store under refrigerated temperatures away from oxidizing materials and sources of ignition (Cameo). Use appropriate PPE when handling materials and avoid all sources of ignition. Avoid oxidisers, acids and incompatible materials.

**Transport Information:** IMDG Class 3. ADR / RID Regulations Class 3 Packaging Code III. IATA Class 3.

## SECTION 11: ECOLOGICAL INFORMATION

## Toxicity Data:

Chemical is volatile and water soluble. Chemical has high mobility in soil and will volatilise readily. Chemical does not persist in the environment and degrades rapidly in all media (days). Chemical does not bioaccumulate.

ACUTE TOXICITY						
Species	Age/Size	Bioassay conditions/analysed parameters				Reference
		Temperature (°C)	Salinity ‰	LC50 -48h	LC50 96h	
Plant	-	-	-	320 mg/L		USEPA
Invertebrate	-	-	-	320 mg/L		
Fish	-	-	-		>520 mg/L	

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**SECTION 12: CASE STUDY – MARITIME INCIDENT**


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No specific incidents recorded for 3-methylpyridine, but several minor spills and leaks of amines reported in UK waters by MCGA. Details of impacts unknown. One larger incident involving amines is reported for the *Sam Houston* in the Gulf of Mexico in 1982. Again details of impact are not known.

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**SECTION 13: CASE STUDY – REPORTED PUBLIC HEALTH EFFECTS**


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No reported studies for methyl pyridine, although products of its combustion such as hydrogen cyanide are well documented.

Lovran, Croatia 1995. Several hundred residents evacuated after fumigation of a building resulted in release of HCN. No fatalities but several residents taken ill with symptoms of poisoning. Monterolier, France 1995. Nine fatalities following a fire lit in caves. A wartime gas bomb was thrown on the fire releasing HCN, which killed 3 children, 4 firemen and 2 other attendant adults.

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**SECTION 14: SOURCES OF FURTHER INFORMATION**


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UK Health Protection Agency	<a href="http://www.hpa.org.uk/Topics/ChemicalsAndPoisons/CompendiumOfChemicalHazards/ne/">http://www.hpa.org.uk/Topics/ChemicalsAndPoisons/CompendiumOfChemicalHazards/ne/</a>
Emergency Response Guidebook	<a href="http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/ergmenu.aspx">http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/ergmenu.aspx</a>
TOXNET Hazardous Substances Database	<a href="http://toxnet.nlm.nih.gov/">http://toxnet.nlm.nih.gov/</a>
PPE Codes	<a href="http://the-ncec.com/assets/Resources/2009EAClist-latest.pdf">http://the-ncec.com/assets/Resources/2009EAClist-latest.pdf</a>
CAMEO	<a href="http://cameochemicals.noaa.gov/">http://cameochemicals.noaa.gov/</a>
ALOHA	<a href="http://www.epa.gov/osweroe1/content/cameo/aloha.htm">http://www.epa.gov/osweroe1/content/cameo/aloha.htm</a>
CEDRE	<a href="http://www.cedre.fr/index-en.php">http://www.cedre.fr/index-en.php</a>
ARCOPOL	<a href="http://www.arcopol.eu/home.aspx">http://www.arcopol.eu/home.aspx</a>
AIHA	<a href="http://www.aiha.org/Pages/default.aspx">http://www.aiha.org/Pages/default.aspx</a>