Pentachloropyridine

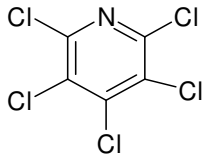
Safety Data Sheet

according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

SECTION 1: Identification

1.1. Identification

PRODUCT NAME	:Pentachloropyridine
CAS RN	:2176-62-7
EC#	:218-535-5
SYNONYMS	: Pentachloropyridine, Perchloropyridine,Pyridine, 2,3,4,5,6-pentachloro- , Pyridine, pentachloro-
SYSTEMATIC NAME	:Pentachloropyridine, Pyridine, 2,3,4,5,6-pentachloro-
MOLECULAR FORMULA	: C_5Cl_5N
STRUCTURAL FORMULA	



1.2. Relevant use of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Pentachloropyridine is used as an intermediate in the agrochemical industry for the production of various herbicides, fungicides and insecticides.

Uses advised against: None

1.3. Details of the supplier of the safety data sheet

FACTORY: Jubilant Life Sciences Ltd., Unit -1, Plot No. P1-L1 within jubilant sector, Specific SEZ for Chemicals at Plot No.-5, Vilayat GIDC, Tal. Vagra, Dist. Bharuch-392012 Gujarat, India, Tel.:+91-2641-281500, 281507 Fax: +91-2641-281515

HEAD OFFICE: Jubilant Life Sciences Ltd., Plot 1-A, Sector 16-A,Institutional Area, Noida, Uttar Pradesh, 201301 - India
T +91-120-4361000 - F +91-120-4234881 / 84 / 85 / 87 / 95 / 96 support@jubl.com - www.jubl.com

1.4. Emergency telephone number

Emergency number :+91-9925236834 & +91-2641-281666

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification
Acute toxicity, Oral: Category 4
Skin irritation: Category 2
Eye irritation: Category 2
Respiratory sensitization: Category 1
Skin sensitization: Category 1
Specific target organ toxicity - single exposure: Category 3
Acute aquatic toxicity: Category 1

Hazard Pictogram: GHS 08,GHS07,GHS09
Signal Word: Danger!

HAZARD AND PRECAUTIONARY STATEMENTS:

HAZARD STATEMENTS

- H302: Harmful if swallowed.
- H315: Causes skin irritation.
- H319: Causes serious eye irritation.
- H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H317: May cause an allergic skin reaction.
- H335 May cause respiratory irritation.
- H400 Very toxic to aquatic life.

PRECAUTIONARY STATEMENTS

- P264: Wash hands thoroughly after handling.
- P270: Do not eat, drink or smoke when using this product.
- P280:Wear protective gloves/protective clothing/eye protection/face protection.
- P261: Avoid breathing dust/fume/gas/mist/vapours/spray.

- P285: In case of inadequate ventilation wear respiratory protection.
- P271: Use only outdoors or in a well-ventilated area.
- P272: Contaminated work clothing should not be allowed out of the workplace.
- P273: Avoid release to the environment.
- P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P330: Rinse mouth.
- P302+P352: IF ON SKIN: Wash with plenty of soap and water.
- P333+313: If skin irritation or a rash occurs: Get medical advice/attention.
- P362: Take off contaminated clothing and wash before reuse.
- P305+P351+P338: IF IN EYES: Rinse continuously 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+341: IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P342+311: Call a POISON CENTER or doctor/physician.
- P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P391: Collect spillage.
- P403+233: Store in a well ventilated place. Keep container tightly closed.
- P405: Store locked up.
- P501: Dispose of contents/container to local/regional/national/international regulations.

SECTION 3: Composition/information on ingredients

Chemical	CAS #	Purity	GHS-US classification
Pentachloropyridine	2176-62-7	~99%	Acute toxicity, Oral: Category 4 Skin irritation: Category 2 Eye irritation: Category 2 Respiratory sensitization: Category 1 Skin sensitization: Category 1 Specific target organ toxicity - single exposure: Category 3 Acute aquatic toxicity: Category 1

SECTION 4: First aid measures

4.1. Description of first aid measures

Key symptoms

- ***Acute effects:***
- Pentachloro pyridine is harmful if swallowed.It causes skin irritation and serious eye irritation.It may cause allergy or asthma symptoms or breathing difficulties if inhaled and an allergic skin reaction.It may cause respiratory irritation.
- *Remarks*: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste), Eye: Lacrimation. Behavioral:Somnolence (general depressed activity). Behavioral: Convulsions or effect on seizure threshold.

Chronic effects:

- To the best of our knowledge chronic effects of this compound have not been fully investigated.

FIRST AID:

- **Eyes**: If in eyes rinse cautiously with water for at least 15 minutes. Continue rinsing. Seek medical attention.
- **Skin:** Immediately take off all contaminated clothing. Wash thoroughly with water for at least 15 minutes. Wash contaminated clothes before reuse.
- **Inhalation**: Remove to fresh air and keep at rest in a position comfortable for breathing. If breathing is difficult give oxygen. Call a physician if you feel unwell.
- **Ingestion**: If swallowed call a poison center if you feel unwell. Rinse mouth. Do NOT induce vomiting by use of emetics. Seek medical attention.

Antidote and emergency treatment

- **Basic treatment:** Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if needed. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for pulmonary edema and treat if necessary. Monitor for shock and treat if necessary. Anticipate seizures and treat if necessary. For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport. Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Cover skin burns with dry sterile dressings after decontamination.
- **Advanced Treatment**: Consider orotracheal or nasotracheal intubation for airway control in the patient who is unconscious, has severe pulmonary edema, or is in respiratory arrest. Positive pressure ventilation techniques with a bag valve mask device may be beneficial. Monitor cardiac rhythm and treat arrhythmias as necessary. Start an IV with D5W /SRP: "To keep open", minimal flow rate/. Use lactated Ringer's if signs of hypovolemia are present. Watch for signs of fluid overload. Consider drug therapy for pulmonary edema. For hypotension with signs

of hypovolemia, administer fluid cautiously. Watch for signs of fluid overload. Treat seizures with diazepam. Use proparacaine hydrochloride to assist eye irritation.

SECTION 5 : FIRE-FIGHTING MEASURES

Extinguishing media:

- *Appropriate extinguishing media*: Dry chemical powder, carbon dioxide, and alcohol resistant foam. Water may also be used. Water spray can be effective in cooling down the fire-exposed containers and knocking down the vapours. Water jets may be used to flush spills away and dilute the same to non-flammable mixtures fog or alcohol-resistant foam by directing streams to the periphery of the fires to prevent spread.

Special Protective Equipment and Precautions for Fire Fighter

- Evacuate the area and fight fires from a safe distance.
- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions or as per locally valid procedures.
- Fire-fighters must wear Self Contained Breathing Apparatus (SCBA).
- Chemical is water-soluble. Report any run-off of firewater's contaminated with this chemical as per local and federal procedures applicable.
- Report any run-off of fire waters contaminated with this chemical as per local and federal procedures applicable.

Unusual fire and explosion hazard

- Toxic vapors may be released on thermal decomposition including nitrogen oxides, carbon monoxide and cyanide.
- High vapor concentration may result in an explosion hazard.
- Vapors are heavier than air. May travel considerable distance from source and flashback.

SECTION 6 : ACCIDENTAL RELEASE MEASURES

Minor Spills

- Clean up all spills immediately following relevant Standard Operating Procedures.
- Avoid breathing vapors and contact with skin and eyes.
- Shut off leak source if possible.
- Shut off all possible sources of ignition.
- Wear protective clothing, boots, impervious gloves and safety glasses.
- Wipe up.
- Collect spillage.
- Decontaminate all equipment.

Major Spill

- Alert Emergency Responders and tell them location and nature of hazard.
- Shut off all possible sources of ignition and increase ventilation.
- Wear protective clothing, full boots, impervious gloves, safety glasses and Self Contained Breathing Apparatus (SCBA), as may be deemed appropriate.
- Clear area of personnel and move upwind.
- Stop leaks if possible.
- Prevent, by any means available, spillage from entering drains or water and watercourses.
- Collect recoverable product into labeled containers for recycling, recovery or disposal.
- Contain spill with sand, earth or vermiculite.
- Spread area with lime or absorbent material, and leave for at least 1 hour before washing.
- Clean up all tools and equipment.
- Inform authorities in event of contamination of any public sewers, drains or water bodies.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

- Do not breathe vapor or mist.
- Wear protective gloves/clothing and eye/face protection.
- Wash thoroughly after handling.
- Ground and secure containers when dispensing or pouring product.
- Avoid contact with incompatible materials.
- When handling,DO NOT eat, drink or smoke.
- Launder contaminated clothing before re-use.
- If on skin or hair, IMMEDIATELY remove all contaminated clothing and rinse/shower with plenty of water.
- Use in a well ventilated place/Use protective clothing commensurate with exposure levels.
- Use non-sparking tools.

7.2. Storage

- Store in a cool, well ventilated place
- Store in a flame proof area
- Store away from incompatible materials.
- Keep only in original container.
- Keep securely closed when not in use.

SECTION 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

- **Exposure Limits Values**

Chemical	ACGIH TLV	OEL ppm	AIHA WEEL	OSHA PEL
Pentachloropyridine	None known	None known	None known	None known

Exposure Limits (International):

- Not available.

Exposure controls

Appropriate Engineering Controls:

- Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits. Local ventilation is usually preferred. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protection:

- Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.
- **Hands:** Wear appropriate protective gloves to prevent skin exposure.
  The protective gloves to be used must comply with the specifications of EC directives 89/686/EEC and the resultant standard EN374.
- **Eyes:** Safety goggles/ Chemical Safety glasses and Face shield.
- **Clothing:** Boots and clothing to prevent contact.
- **Respirator:** Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

  For emergency situations, wear a positive pressure, pressure-demand, full face piece self- contained breathing apparatus (SCBA) or pressure-demand supplied air respirator with escape SCBA and a fully-encapsulating, chemical resistant suit. (EPA,1998).

General Hygiene and general comments:

- Wash hands and face after working with substance.
- Immediately change contaminated clothing.
- Apply skin protective barrier cream.

SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

- **Information on basic physical and chemical properties.**

Sr.No.	Parameter	Typical value
1	Appearance	White to light yellow solid
2	Odor	Not available
3	Odor threshold	Not available
4	Melting point	124-126 °C
5	Boiling point	280°C
6	Flash point	Not available
7	Evaporation rate (n-BuAc=1)	Not available
8	Explosive limits	Not available
9	Vapor pressure	0.01 mm Hg @ 20 deg C
10	Vapor density (air=1)	2.73 (Air=1)
11	Specific gravity (water=1)	0.98
12	Solubility	Very soluble in benzene, ethanol, ligroin
13	pH (16 g/l@20°C)	8.5
14	Log Pow (octonol/water)	3.53
15	Auto-ignition temperature	Not soluble
16	Decomposition temperature	Not available
17	Viscosity	Not available
18	Flammability	Not available
19	Molecular Weight	251.31
20	pKa (@25^{0}C)	1.00

SECTION 10: STABILITY AND REACTIVITY

- **Stability:** Stable under normal temperature and pressures.
- **Conditions to avoid:** Incompatible materials, ignition sources, excess heat, flames and sparks, strong acids, strong oxidants, exposure to moist air or water.
- **Incompatible chemicals:** Oxidizing agents and strong reducing agents.
- **Hazardous decomposition:** Thermal decomposition may produce carbon monoxide, carbon dioxides, oxides of nitrogen, Hydrogen Cyanide, Hydrogen Chloride irritating & toxic fumes.
- **Hazardous Polymerization**: Not reported.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

- ***Acute toxicity***
- Pentachloro pyridine is harmful if swallowed.It causes skin irritation and serious eye irritation.It may cause allergy or asthma symptoms or breathing difficulties if inhaled and an allergic skin reaction.It may cause respiratory irritation.
- *Remarks*: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste), Eye: Lacrimation. Behavioral:Somnolence (general depressed activity). Behavioral: Convulsions or effect on seizure threshold.
- RTECS#**:** UT7000000
- Oral Rat LD50: 435 mg/kg

a) Skin corrosion/irritation
- Causes skin irritation.

b) Serious eye damage/irritation
- Causes serious eye irritation.

c) Respiratory or skin sensitization
- May cause allergy or asthma symptoms or breathing difficulties if inhaled and an allergic skin reaction.

d) Germ cell Mutagenicity
- No data is available.

e) Carcinogenicity
- Not listed by NTP, IARC and OSHA.
- Not present on the EU CMR list.
- According to information presently available2,3,4,5,6-Pentachloropyridine is not found to be carcinogenic.

f) Reproductive toxicity
- No data is available.

g) STOT-single exposure
- May cause respiratory irritation.

h) *STOT- repeated exposure*
- No data available.

i) Aspiration Hazards
- No data available.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

- **Ecotoxicity:**

Ecotoxicity:

- **Fish**

Species: Pimephalus Promelas (Fathead Minnow)
Result: LC50 96 Hr.:0.47 mg/l
Conditions: 24.3 deg C, dissolved oxygen 6.0 mg/l, hardness 45.0 mg/l CaCO3,
Alkalinity 51.5 mg/l CaCO3, and pH 7.57.
Reference: Vol. III. Superior, Wisconsin: University of Wisconsin-Superior, 1986.
Species: Pimephalus Promelas (Fathead Minnow)
Result: EC50 96 Hr.:0.44 mg/l
Conditions: 24.3 deg C, dissolved oxygen 6.0 mg/l, hardness 45.0 mg/l CaCO3, Alkalinity 51.5 mg/l CaCO3, and pH 7.57.
Effect: Loss of equilibrium
Reference: Vol. III. Superior, Wisconsin: University of Wisconsin-Superior, 1986.

Persistence and degradability

- Pentachloropyridine is expected to be resistant to biodegradation under aerobic conditions in both soil and water based on soil data from structurally-similar compounds. Only <0.1% and 3% of the available nitrogen was released over 64 days following the application of 2,3- and 2,6- dichloropyridine to soil.
- This compound may be susceptible to anaerobic biodegradation via dehalogenation.

Bio accumulative potential

- BCF = 105
- Log Kow = 3.53
- An estimated BCF of 105 suggests the potential for bioconcentration in aquatic organisms is high. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is high.

Mobility in soil

- Koc=2000Low mobility.
- Henry's Law constant: 6.3X10-3 atm-cu m/mole.
- Log Kow=3.53
- If released into water, pentachloropyridine may adsorb to suspended solids and sediment based upon the estimated Koc.Volatilization from water surfaces is expected to be an important fate process based upon this compound's estimated Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 5 hours and 6 days, respectively.However, volatilization from water surfaces is expected to be attenuated by adsorption to suspended solids and sediment in the water column; a half-life of 4.3 years is estimated if adsorption is considered in a model pond scenario.

Other adverse effects

- **Environment Fate:**
- Based on environmental modeling,it is very toxic to aquatic life.If it is released to air, a vapor pressure of $1.4X10^{-2}$ mm Hg at 25 deg C indicates pentachloropyridine will exist solely as a vapor. Vapor-phase pentachloropyridine will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 4 years. If released to soil, pentachloropyridine is expected to have low mobility based upon an estimated Koc of 2000.Volatilization from moist soil surfaces is expected to be an important fate process based upon an estimated Henry's Law constant of 6.3X10-3 atm-cu m/mole.. Since this is an estimated result it is recommended that the material should not be disposed into the environment. The material should never be disposed into the sewage.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

- Burn in a chemical incinerator equipped with an afterburner and scrubber.Exert extra care in igniting, as this material is combustible.
- Dispose of this material in accordance with standard practice for disposal of potentially hazardous materials as required by applicable federal, state or local laws. Note that disposal regulations may also apply to empty containers and equipment reinstates.

SECTION 14: Transport information

This substance is considered to be Hazardous for transport by Air/Rail/Road and Sea and thus regulated by IATA/ICAO/ARD/RID/IMO/IMDG.

S.No	Agency	UN Number	Proper Shipping name	Hazard Class	Packing Group
Land Transport	ADR/RIC	UN 3077	Environmentally Hazardous substance, solid,N.O.S (Penta chloropyridine)	9	III
Maritime Transport	IMDG	UN 3077	Environmentally Hazardous substance, solid,N.O.S (Penta chloropyridine)	9	III
Air Transport	IATA	UN 3077	Environmentally Hazardous substance, solid,N.O.S (Penta chloropyridine)	9	III
Hazard Label		**Environmentally Hazardous**			

Environmental hazards:

- Marine pollutant: Yes

SECTION 15: REGULATORY INFORMATION

- **European Union Information**

Classification as per CLP Regulation 1272/2008:

- **Hazards Class and Category**: *Acute tox oral cat.4; skin irritation Cat.2; Eye irrit. Cat2; Resp. sens.Cat ; Skin sense. Cat ;,STOT SE Cat 3;Aquatic Acute Cat 1*
- **Hazard Statements:***H302; H315,H319,H334,H317,H335,H400*

Chemical Inventory Lists:	Status
TSCA:	Present
EINECS:	218-535-5
Canada(DSL/NDSL):	Listed/NDSL
Japan:	Not listed
Korea:	Present
Australia:	Not listed
China: IECSC	Not listed

US information

- **TSCA**
  CAS# 2176-62-7 is listed on the TSCA inventory.
- **Health & Safety Reporting List**
  None of the chemicals are on the Health & Safety Reporting List.
- **Chemical Test Rules**
  None of the chemicals in this product are under a Chemical Test Rule.
- **Section 12b**
  None of the chemicals are listed under TSCA Section 12b.
- **TSCA Significant New Use Rule**
  None of the chemicals in this material have a SNUR under TSCA.
- **CERCLA Hazardous Substances and corresponding RQs**
  None of the chemicals in this material have an RQ.
- **SARA Section 302 Extremely Hazardous Substances**
  None of the chemicals in this product have a TPQ.
- **Section 313**

No chemicals are reportable under Section 313.

- **Clean Air Act:**

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

- **Clean Water Act:**
  None of the chemicals in this product are listed as Hazardous Substances under the CWA.
  None of the chemicals in this product are listed as Priority Pollutants under the CWA.
  None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
- **OSHA:**
  None of the chemicals in this product are considered highly hazardous by OSHA.
- **STATE**
  CAS# 2176-62-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
- **California Prop 65**
  California No Significant Risk Level: None of the chemicals in this product are listed.
- **WGK (Water Danger/Protection)**
  CAS# 2176-62-7: No information available.
- **Canada - DSL/NDSL**
  CAS# 2176-62-7 is listed on Canada's NDSL List.
- **Canada - WHMIS**
  This product has a WHMIS classification of D1B, D2B.

SECTION 16: OTHER INFORMATION

a) Compilation information of safety data sheet

Date of compilation	: May 29, 2012
Chemical	: Pentachloropyridine
CAS #	:2176-62-7
File Name	: 0449Bh Ghs08 Div.5 sdsPentachloropyridine
Revision Number	: 08

Date of Issue : January 18, 2016
Revision Due Date : December, 2018
Supersedes date : August 19, 2015

b) A key or legend to aberrations and acronyms used in the safety data sheet

- PBT =Persistent Bioaccumulative and Toxic.
- vPvB= Very Persistent and Very Bioaccumulative.
- SCBA= Self Contained Breathing Apparatus.
- NIOSH REL= National Institute for Occupational Safety and Health Recommended Exposure Limit. OSHA PEL=Occupational Safety and Health Administration Permissible Exposure Limit.
- OELTWA= Occupational Exposure Limit Time Weighted Averages.
- IDLH= Immediately Dangerous to Life or Health.
- UEL= Upper Explosive Limit.
- LEL= Lower Explosive Limit.
- RTECS= Registry of Toxic Effects of Chemical Substances.
- NTP=National Toxicology Program
- IARC= International Agency for Research on Cancer.
- EPA=Environmental Protection Agency.
- TSCA= Toxic Substances Control Act.
- CERCLA= Comprehensive Environmental Response, Compensation, and Liability Act.
- SARA= Superfund Amendments and Reauthorization Act.
- NFPA= National Fire Protection Association.
- WHIMS= Workplace Hazardous Materials Information System.
- DSL/NDSL= Domestic/Non-Domestic Substances List.
- CSR=Chemical Safety Report.
- BCF = Bio Concentration Factor.
- DNEL = Derived No Effect Level.
- PNEC = Predicted No Effect Concentration.
- TLV = Threshold Limit Value.
- ACGIH = American Conference of Governmental Industrial Hygienists.
- REACH = Registration, Evaluation .Authorization and Restriction of Chemicals.
- CLP = Classification, Labeling and Packaging.
- LD / LC = Lethal Doses / Lethal Concentration.
- GHS = Globally Harmonized System.
- ADR = Accord europeen relative au transport international de marchandises.
- IMDG-Code = International Maritime Code for Dangerous Goods.
- EmS = Emergency measures on Sea.
- ICAO = International Civil Aviation Organization.
- IATA/DGR= International Air Transport Association/Dangerous Goods Regulation.

c) Key Literature reference and sources for data

Biographical reference and data sources

- CLP REG (regulation) (EC) no. 1272/2008, last modification by regulation (EC) no. 790/2009
- DIR 67/548/EWG, last modification by DIR 2009/2/EC
- REG (EC) no. 1907/2006, last modification by REG (EC) Nr. 453/2009

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intented to describe the product for the purposes of health,safety and environmental requirements only.It should not therefore be construed as guaranteeing any specificproperty of the product.

(End of Safety Data Sheet)