

2-Bromopyridine

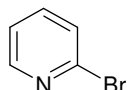
Safety Data Sheet

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

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

PRODUCT NAME	: 2-Bromopyridine
CAS RN	: 109-04-6
EC#	: 203-641-6
SYNONYMS	: 2-Pyridyl bromide, Pyridine, 2-bromo-, beta-Bromopyridine, o-Bromopyridine
SYSTEMATIC NAME	: 2-Bromopyridine, -Pyridine, 2-bromo-
MOLECULAR FORMULA	: C ₅ H ₄ BrN
STRUCTURAL FORMULA	



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

1.2.1. Relevant identified uses

2-Bromopyridine is used as an intermediate in the pharmaceutical industry for the manufacture of Atazanavir (an antiretroviral drug), Carbinoxamine, Chloropyramine, triprolidine (antihistamine drugs), Disopyramide Phosphate (an antiarrhythmic drug), Mefloquine (antimalarial drug), Pipradrol (mild CNS stimulant) etc.

Uses advised against: None

1.3. Details of the supplier of the safety data sheet

Jubilant Life Sciences Limited

FACTORY & REGISTERED OFFICE: Jubilant Life Sciences Ltd., B-34,M.I.D.C. Vadolgaon,Ambernath(W)- 421501,Maharashtra, India
T +91-251-2601588 F +91-251-2610078

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 : +91-9689925834

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Flammable Liquid: category 3
Acute toxicity Oral: Category 3
Acute Toxicity Dermal: Category 2
Skin corrosion / irritant: Category 2
Serious eye damage/eye irritant: Category 2A
STOT-Single Exposure: Category 3

2.2. Label Elements

Hazard Pictogram: GHS 06, GHS 02



Signal Word: Danger!

HAZARD AND PRECAUTIONARY STATEMENTS:

HAZARD STATEMENTS

- H226: Flammable liquid and Vapor.
- H301: Toxic if swallowed.
- H310: Fatal in contact with skin.
- H 315: Causes skin irritation.
- H319: Causes serious eye irritation.
- H335: May cause respiratory irritation.

PRECAUTIONARY STATEMENTS

- P210: Keep away from heat/sparks/open flames/.../hot surfaces. ... No smoking.
- P233: Keep container tightly closed.



2-Bromopyridine Safety Data Sheet

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

- P240: Ground/bond container and receiving equipment.
- P264: Wash hands thoroughly after handling.
- P270: Do not eat, drink or smoke when using this product.
- P 280: Wear protective gloves /protective clothing/eye protection/face protection.
- P262: Do not get in eyes, on skin, or on clothing.
- P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
- P271: Use only outdoors or in a well-ventilated area.
- P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- P330: Rinse mouth.
- P302+P350: IF ON SKIN: Gently wash with plenty of soap and water.
- P310: Immediately call a POISON CENTER or doctor/physician.
- P361: Remove/Take off immediately all contaminated clothing.
- P363: Wash contaminated clothing before reuse.
- P302+P352: IF ON SKIN: Wash with plenty of soap and water.
- P332+P313: If skin irritation occurs: Get medical advice/attention.
- 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 victim to fresh air and keep at rest in a position comfortable for breathing.
- P403 + P235: Store in a well-ventilated place. Keep cool.
- P501: Dispose of contents/container to local/regional/national/international regulations.

SECTION 3: Composition/information on ingredients

Chemical	CAS #	EC#	Purity	GHS-US classification
2-Bromopyridine	109-04-6	203-641-6	> 99 %	Flammable Liquid: category 3 Acute toxicity Oral: Category 3 Acute Toxicity Dermal: Category 2 Skin corrosion / irritant: Category 2 Serious eye damage/eye irritant: Category 2A STOT-Single Exposure: Category 3

SECTION 4: First aid measures

4.1. Description of first aid measures

Key symptoms

Acute effects

- 2-Bromopyridine is toxic if swallowed and fatal in contact with skin. It is irritating to skin, eyes and respiratory system. It is harmful if inhaled and vapors may cause dizziness and suffocation. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.
- **Chronic effects:**
To the best of our knowledge, the chronic health effects of this product have not been fully investigated.

FIRST AID

- **Eyes:** If in eyes rinse cautiously with water for at least 15 minutes. Remove contact lenses if easy to do so. 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. Seek immediate medical attention.
- **Inhalation:** Remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if you feel unwell. Monitor for respiratory distress. Apply artificial respiration if not breathing. Do not use mouth-to-mouth methods if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
- **Ingestion:** If swallowed call a poison center if you feel unwell. Rinse mouth. Do NOT induce vomiting by use of emetics. Seek medical attention.



2-Bromopyridine

Safety Data Sheet

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

SECTION 5 : FIRE-FIGHTING MEASURES

5.1. Extinguishing media

- *Appropriate extinguishing media:* Dry chemical powder, carbon dioxide, and alcohol resistant foam. Water may also be used. Water sprays 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.

5.2. 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).
- Report any run-off of firewater's contaminated with this chemical as per local and federal procedures applicable.

5.3. 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.
- When heated to decomposition, it emits highly toxic fumes.
- 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.
- 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.

7.2. Storage

- Store in a cool, dry and ventilated place.
- Store away from incompatible materials.
- Keep securely closed when not in use.
- Keep only in original container.

SECTION 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

- **Exposure Limits Values**



2-Bromopyridine

Safety Data Sheet

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

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
2-Bromopyridine	None listed	None listed	None listed

Exposure Limits (International):

- Not available.

8.2. 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.

8.3. 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:

- Immediately change contaminated clothing.
- Apply skin protective barrier cream.
- Wash hands and face after working with the substance.
- Under no circumstances eat or drink at the workplace.
- Do not inhale substances, work under hood.

SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties.

Sr.No.	Parameter	Typical value
1.	Appearance	Colorless to pale yellow liquid.
2.	Odor	Characteristic Odor
3.	Odor Threshold	Not Available
4.	pH	4-5(5% Aqueous solution)
5.	Melting point/Freezing point	Not Available
6.	Boiling Point	192-194 °C @760 mm Hg
7.	Flash point	54°C closed cup
8.	Evaporation rate (n-BuAc=1)	Not available
9.	Flammability	Flammable
10.	Upper/lower flammability or Explosive limits	Not available
11.	Vapor pressure	Not available
12.	Vapor density (air=1)	Not available
13.	Relative density	1.65
14.	Solubility	Solubility in water is 2.5g/L at 20 °C. Soluble in organic solvent like Methanol, Isopropyl Alcohol, Tetrahydrofuran, Ethyl Acetate, Acetone and Toluene etc.
15.	Partition coefficient : n-(Octanol / water)	1.42 (estimated)
16.	Auto-ignition temperature	>400°C
17.	Decomposition temperature	Not available



2-Bromopyridine

Safety Data Sheet

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

18.	Viscosity	Not available
19.	Explosive property	No
20.	Oxidizing property	No

SECTION 10: STABILITY AND REACTIVITY

- **Stability:** Stable under normal temperature and pressures. It is sensitive to light.
- **Conditions to avoid:** Keep away from High temperature, sparks, moist condition, mechanical shock, incompatible materials, ignition sources, excess heat. Strong Heating, A range approximately 15 Kelvin below the Flash Point to be treated as critical. Avoid direct light.
- **Incompatible chemicals:** Strong oxidizing agents, strong acids, azodiazio compounds and hydrazine.
- **Hazardous decomposition products:** Thermal decomposition may produce carbon monoxide and oxides of nitrogen, carbon dioxide & nitrogen, Hydrogen chloride, hydrogen cyanide and irritating and toxic fumes. Thermal decomposition may also produce hydrogen bromide gas. Forms explosive mixture with air on intense heating.
- **Hazardous Polymerization:** Not reported.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

- **Acute toxicity**
- 2-Bromopyridine is toxic if swallowed and fatal in contact with skin. It is irritating to skin, eyes and respiratory system. It is harmful if inhaled and vapors may cause dizziness and suffocation. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

RTECS#: US3850000

LD50/LC50:

- **Type of test:** LD 50 lethal dose
- **Route of exposure:** Intraperitoneal
- **Species observed:** Rodent mouse
- **Dose data:** 31300 ug/kg.
- **Toxic effects:** Behavioral – somnolence (general depressed activity) Behavioral - antipsychotic Liver - fatty liver degeneration
- **Reference:** Research Council Chemical-Biological Coordination Center. (National Academy of Science Library, 2101 Constitution Ave., NW, Washington, DC 20418) Volume(issue)/page/year: 4,322,1952
- **Other Reported Data :-**

Acute Toxicity Oral:- Oral, rat: LD50 = 92 mg/kg

Acute Toxicity Dermal:- Dermal, rabbit: LD50 = 81.5 mg/kg.

- Skin corrosion/irritation**
 - Causes skin irritation.
- Serious eye damage/irritation**
 - Causes serious eye irritation.
- Respiratory or skin sensitization**
 - It causes respiratory tract irritation It may cause gastrointestinal irritation with nausea, vomiting and diarrhea.
- Germ cell Mutagenicity**
 - No data is available.
- Carcinogenicity**
 - Not listed by NTP, IARC and OSHA.
 - Not present on the EU CMR list.
 - According to information presently available 2-Bromopyridine is not found to be carcinogenic.
- Reproductive toxicity**
 - No data is available.
- STOT-single exposure**
 - Causes irritation to respiratory system.
- STOT- repeated exposure**
 - No data available.
- Aspiration Hazards**
 - No data available.

2-Bromopyridine

Safety Data Sheet

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

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Ecotoxicity:

- The Ecotoxicity data is not available.
- Fish ChV : - 28mg/l (Estimated).
- Fish 96-hr LC50 = 411.010mg/l (Predicted).
- Fish 14-day LC50 = 678.941mg/l (Predicted).
- Daphnia 48-hr LC50 = 423.109mg/l (Predicted).
- It is expected to be non toxic to aquatic organisms.

Persistence and degradability

- It is expected to be biodegradable in aerobic and anaerobic conditions.

Bio accumulative potential

- BCF = 2.5
- Log Kow= 1.42

Based on the Log Kow and Bioconcentration factor value it is expected to have low potential to concentrate in fatty tissue of fish and aquatic organisms relative to its surroundings.

Mobility in soil

- Log Koc= 1.72 (estimated). Low sorption.
- Henry's Law Constant: 2.81×10^{-04} atm-m³/mole at 25 degrees. It is expected to be volatile from aqueous phase.
- Log Kow=1.42 (estimated). Low potential to bioaccumulation.

Other adverse effects

Environment Fate:

Based on the environmental modeling, this material has a low potential to get absorbed in the organic matter of soil and is expected to be volatile from aqueous bodies. 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 2929	Toxic liquid, flammable, organic N.O.S. (2-Bromopyridine)	6(6.1), 3	II
Maritime Transport	IMDG	UN 2929	Toxic liquid, flammable, organic N.O.S. (2-Bromopyridine)	6(6.1), 3	II
Air Transport	IATA	UN 2929	Toxic liquid, flammable, organic N.O.S. (2-Bromopyridine)	6(6.1), 3	II
Hazard Label		Toxic Flammable		 	



2-Bromopyridine

Safety Data Sheet

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

Environmental hazards:

- Marine pollutant: No

SECTION 15: REGULATORY INFORMATION

- **European Union Information**

Classification as per CLP Regulation 1272/2008:

- **Hazards Class and Category:** Flamm.Liq. Cat.3, Acute Tox Oral Cat.3, Acute ToxDerm. Cat.2, Skin irrit Cat.2, Eye damage Cat.2, STOT SE Cat. 3
- **Hazard Statements:** H226; H301; H310; H315; H319 H335

Chemical Inventory Lists:	Status
TSCA:	Present
EINECS:	203-641-6
Canada(DSL/NDSL):	Listed/NDSL
Japan:	Not listed
Korea:	Not listed
Australia:	Not listed
China: IECSC	Present

US information

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.

SARA

Section 302 (RQ)

- None of the chemicals in this material have an RQ.

Section 302 (TPQ)

- 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

- 2-Bromopyridine, 99% is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level:

- None of the chemicals in this product are listed.

SECTION 16: OTHER INFORMATION

a) Compilation information of safety data sheet

Date of compilation	: June 19, 2012
Chemical	: 2-Bromopyridine
CAS #	: 109-04-6
File Name	: 0034Am Ghs09 Div.3 sds 2-Bromopyridine
Revision Number	: 09
Date of Issue of SDS	: December 24, 2015
Revision Due Date	: November ,2017
Supersedes date	: September 16, 2015



2-Bromopyridine

Safety Data Sheet

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

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/NDL= Domestic/Non-Domestic Substances List.
- CSR=Chemical Safety Report.
- BCF = Bio Concentration Factor.
- 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 intended to describe the product for the purposes of health,safety and environmental requirements only.It should not therefore be construed as guaranteeing any specific property of the product.

(End of Safety Data Sheet)