

Phenol (Carbolic Acid)

CAS Number: 108-95-2

Chemical Formula: C₆H₅OH

Refer to the Material Safety Data Sheet (MSDS) before handling this material.

What is Phenol?

Phenol, also known as carbolic acid or hydroxybenzene, is a colorless solid or a clear, thick liquid with a characteristically sweet odor. Phenol is derived from the basic raw materials of benzene and propylene. These materials are used to produce cumene, which is used to produce phenol and its co-product, acetone. Georgia Gulf produces phenol at its chemical facility located in Plaquemine, Louisiana.

How is Phenol used?

Phenol is used predominantly by other chemical manufacturers and industrial users. Phenol is a key raw material in many manufacturing processes due to its unique reactivity and solvency properties. A weak organic acid, phenol can be safely used in processes and products that benefit consumers. The typical American uses numerous products which utilize phenol in their manufacturing processes. Plywood, window glazing, DVDs and CDs, computers and sports equipment are some of the many items that rely on this important raw material. Phenol is a major component of phenolic adhesives (i.e. glue) used in wood products such as plywood and oriented strand board. It is also used to produce phenolic resins, which are used in the molding of heat-resistant components for household appliances, counter-top and flooring laminates, and foundry castings. In addition, it is a valuable intermediate in the manufacture of detergents, disinfectants, agricultural chemicals, medicines, and dyes.

Physical/Chemical Properties

Phenol is a crystalline solid with a melting point of 105°F. It is a weak organic acid which is partly soluble in water and ranges in color from colorless/white to pink, yellow, amber, red, or brown when exposed to air. Phenol exhibits an antiseptic odor which is usually noticeable at concentrations many times lower than regulatory exposure limits. Phenol is not flammable but will burn if involved in a fire. It is stable under recommended storage conditions.

Properties of Phenol	
Boiling Point	359.6°F (182°C)
Melting Point	105°F (40°C)
Flash Point (closed cup)	174°F (79°C)
Vapor Pressure @ 77°F	0.35 mm Hg
Specific Gravity @ 25°/4°C (Water = 1.0)	1.071
Vapor Density @ 60°F (air = 1)	3.24

Health and Safety Information

Phenol in liquid or vapor form is readily absorbed through the skin and mucous membranes and acts as a systemic toxin or poison. Moderate exposure to the skin might be fatal since phenol deadens the feeling sensation in exposed areas which may cause victims to misjudge or prolong contact. Progressive symptoms of such poisoning include headache, dizziness, ringing in the ears, nausea, vomiting, muscular twitching, mental confusion, loss of consciousness, and possible death from paralysis of the central nervous system. Phenol liquids and vapors can cause severe skin, eye, respiratory, and digestive tract burns.

The Occupational Safety and Health Administration (OSHA) and the American Conference of Governmental Industrial Hygienists (ACGIH) has assigned an eight-hour occupational exposure limit of 5 parts per million (ppm) for phenol vapor. The OSHA and ACGIH exposure limits have a “skin” notation indicating potential contribution to the overall exposure by the cutaneous route including mucous membranes and eye, either by airborne or, more particularly, by direct contact with the substance.

Although phenol is classified as a mutagen, and such chemicals may have a cancer risk, there is inadequate evidence in experimental animals for the carcinogenicity of phenol. The International Agency for Research on Cancer (IARC) classification for phenol is Group 3 meaning it is not classifiable with regard to its carcinogenicity to humans. Phenol is not listed as a carcinogen by OSHA or the National Toxicology Program (NTP).

Environmental Information

Phenol is readily biodegradable. It has a low bioconcentration potential, meaning phenol does not accumulate in tissues of living organisms. Phenol is moderately toxic to aquatic organisms on an acute basis. Care should be taken to prevent spills from entering waterways. In case of fire, phenol vapors may form.

Exposure Potential

Phenol is used in the production of industrial and consumer products. Based on the uses for phenol, exposure could occur through:

- **Workplace Exposure** – Phenol is manufactured in a closed process to minimize employee exposure potential. Occupational exposure could occur either in a phenol manufacturing facility, or in the various industrial or manufacturing facilities that use phenol or phenol-containing products. Those exposures could occur during maintenance, sampling, or other procedures. Each manufacturing facility should have a thorough training program, appropriate work processes, and safety equipment in place to limit unnecessary phenol exposure.
- **Consumer exposure** – Georgia Gulf does not sell phenol for direct consumer use.
- **Environmental releases** – In the event of a spill, evacuate the area. Allow only trained personnel with appropriate personal protective equipment in spill area. Prevent phenol from entering water bodies, drains, or any sewage collection systems. For small spills apply sand or other non-combustible absorbent material and place into containers for later disposal. Control large spills by diking and pump to salvage vessels. If material solidifies, shovel it into steel containers.

Product Stewardship

Georgia Gulf Corporation is committed to managing phenol so that it can be safely used by its employees and customers. Georgia Gulf's relationships with its customers encourage communication about safety and environmental stewardship.

Georgia Gulf Corporation is staffed and organized to provide advice regarding appropriate corrective actions if an incident should occur.

Conclusion

Phenol is an important chemical feedstock for products that consumers use every day at home, in travel, and in the workplace. It has a long history of helping make our lives more comfortable, safe, productive, and healthy. Phenol is regulated for public safety and measures are in place for its safe manufacture, storage, distribution, and use.

Additional information:

- [Material Safety Data Sheet](#)
- [Agency for Toxic Substances and Disease Registry \(ATSDR\), Toxicological Profile for Phenol](#)
- [Hazardous Substances Databank Number 113, Last Revision 20031015](#)

Notice

Prior to its use, the user is responsible for determining the suitability of the product or products covered by this Product Stewardship Summary and for complying with all federal, state, and local laws and regulations in connection with its use. Neither Georgia Gulf nor any of its affiliates shall be responsible for any damages of any kind whatsoever resulting from the use of or reliance on this Product Stewardship Summary or product or products to which it refers.

This Product Stewardship Summary is intended only to provide a general summary of the potential hazards associated with the product or products described herein. It is not intended to provide detailed information about potential health effects and safe use and handling information and, although Georgia Gulf believes this information is correct; Georgia Gulf makes no warranties as to its completeness or accuracy. Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the Georgia Gulf product(s) mentioned in this document. Before working with any of these products, users must read and become familiar with the available information on product hazards, proper use, and handling. Information is available in several forms, such as material safety data sheets (MSDS) and product labels. A copy of Georgia Gulf's MSDS for phenol can be obtained by going to the company's website (www.ggc.com) and clicking "Products."

This information is subject to change without notice.

PRRT Approval:

Legal Approval:

Status: Original

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Contact GGC's RCMS® Team

To contact a member of Georgia Gulf Corporation's Responsible Care® staff, [click here](#).

You can also write us for additional information at:

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