

Chloroxylenol

1 Nonproprietary Names

BP: Chloroxylenol
USP: Chloroxylenol

2 Synonyms

4-Chloro-3,5-dimethylphenol; *Nipacide PX*; parachlorometaxylenol; *p*-chloro-*m*-xylenol; PCMX.

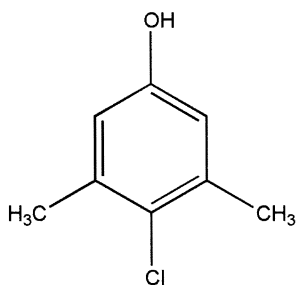
3 Chemical Name and CAS Registry Number

4-Chloro-3,5-xyleneol [88-04-0]

4 Empirical Formula Molecular Weight

C₈H₉ClO 156.61

5 Structural Formula



6 Functional Category

Antimicrobial preservative; antiseptic; disinfectant.

7 Applications in Pharmaceutical Formulation or Technology

Chloroxylenol is a common constituent of many proprietary disinfectants used for skin and wound disinfection; *see* Table I.

As a pharmaceutical excipient, chloroxylenol is commonly used in low concentrations as an antimicrobial preservative in topical formulations such as creams and ointments. Chloroxylenol is also used in a number of cosmetic formulations.

Therapeutically, chloroxylenol has been investigated as a treatment for acne vulgaris,⁽¹⁾ and also for treating infected root canals.⁽²⁾

Table I: Uses of chloroxylenol.

Use	Concentration (%)
Antiseptic powder	0.5
Antimicrobial preservative for otic and topical preparations	0.1–0.8
Disinfectant	2.5–5.0

8 Description

White or cream-colored crystals or crystalline powder with a characteristic phenolic odor. Volatile in steam.

9 Pharmacopeial Specifications

See Table II.

Table II: Pharmacopeial specifications for chloroxylenol.

Test	BP 2001	USP 25
Identification	+	+
Characters	+	—
Residue on ignition	—	≤0.1%
Water	—	≤0.5%
Iron	—	≤0.01%
Melting range	114–116 °C	114–116 °C
Related substances	+	+
Assay	98.0–103.0%	≥98.5%

10 Typical Properties

Antimicrobial activity: chloroxylenol is effective against Gram-positive bacteria but less active against Gram-negative bacteria. The activity of chloroxylenol against Gram-negative bacilli can be increased by the addition of a chelating agent such as edetic acid.⁽³⁾ Chloroxylenol is inactive against bacterial spores. Antimicrobial activity may be reduced by loss of chloroxylenol from a formulation due to incompatibilities with packaging materials or other excipients, such as nonionic surfactants.⁽⁴⁾ Solution pH does not have a marked effect on the activity of chloroxylenol.⁽⁵⁾

Boiling point: 246 °C

Melting point: 115.5 °C

Solubility: freely soluble in ethanol (95%); soluble in ether, terpenes, and fixed oils; very slightly soluble in water. Dissolves in solutions of alkali hydroxides.

11 Stability and Storage Conditions

Chloroxylenol is stable at normal room temperature, but is volatile in steam. Contact with natural rubber should be avoided. Aqueous solutions of chloroxylenol are susceptible to microbial contamination and appropriate measures should be taken to prevent contamination during storage or dilution. Chloroxylenol should be stored in polyethylene, mild steel or stainless steel containers, which should be well-closed and kept in a cool, dry place.

12 Incompatibilities

Chloroxylenol has been reported to be incompatible with nonionic surfactants and methylcellulose.

13 Method of Manufacture

Chloroxylenol is prepared by treating 3,5-dimethylphenol with chlorine or sulfuryl chloride (SO₂Cl₂).

14 Safety

Chloroxylenol is generally regarded as a relatively nontoxic and nonirritant material when used as an excipient. However, allergic skin reactions have been reported.^(6,7) Taken orally, chloroxylenol is mildly toxic and has been associated with isolated reports of fatal⁽⁸⁾ or severe instances of self-poisoning.^(9,10)

LD₅₀ (mouse, IP): 0.115 g/kg⁽¹¹⁾

LD₅₀ (rat, oral): 3.83 g/kg

15 Handling Precautions

Observe normal precautions appropriate to the circumstances and quantity of material handled. Chloroxylenol is an eye irritant and eye-protection is recommended. When heated to decomposition, chloroxylenol emits toxic fumes.

16 Regulatory Status

Included in the FDA Inactive Ingredients Guide (topical creams and emulsions). Included in nonparenteral medicines licensed in the UK.

17 Related Substances

Chlorocresol.

18 Comments

The EINECS number for chloroxylenol is 201-793-8.

19 Specific References

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20 General References

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21 Author

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22 Date of Revision

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