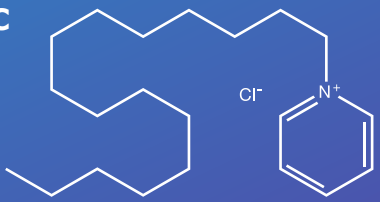
Cetylpyridinium Chloride (CPC)

The effective antimicrobial agent

Vertellus™

Smart Chemistry. Our Specialty.™

CPC



Cetylpyridinium Chloride (CPC) (powder)

CPC demonstrates varying degrees of activity against bacteria. It is effective over a broad pH range and exhibits broad anti-microbial efficacy against Gram-positive and Gram-negative bacteria, yeast, and mold. It is widely used in over-the-counter products including mouthwash, throat lozenges, nasal sprays and antiseptic (first aid) creams and lotions. It is also used as an active pharmaceutical ingredient and an excipient in pharmaceutical products.

Suggested use level: 0.1 - 0.2% for oral care, leave-on and rinse-off cosmetics and toiletries

CPC meets requirements for monographs of the US, European and Japanese Pharmacopoeia.**

*Cetylpyridinium chloride may be used as a preservative in cosmetic and personal care products in the USA
**Please check with your local regulatory authorities for allowed uses

A quaternary ammonium compound that is a biodegradable antimicrobial* for oral care, rinse-off and leave-on cosmetics and toiletries including:

- Skincare creams
- Skincare lotions
- Antiperspirants
- Deodorants
- Hair care
- Sun care
- Hand sanitizers
- Color cosmetics

Vertellus offers CPC in two forms: powder & liquid. Both Cetylpyridinium Chloride (CPC) and Freshstat™ Cetylpyridinium Chloride are manufactured under cGMP conditions in the USA.

Freshstat™ Cetylpyridinium Chloride (liquid)

A versatile, safe and cost-effective preservative with an excellent safety profile. It is effective over a broad pH range and exhibits broad anti-microbial efficacy against Gram-positive and Gram-negative bacteria, yeast, and mold. The active ingredient, CPC, is biodegradable and is an excellent alternative to commonly used preservatives. Freshstat™ preservative is pH neutral. It has a Propylene Glycol base, excellent solubility, stability and is colorless, odorless, and formaldehyde free.

Composition: 40% CPC, 60% Propylene Glycol

Suggested use level: 0.25 - 0.75%

CPC and propylene glycol each meet the USP grade for purity.

▸▸ Click on product trade name to learn more at vertellus.com.

Effectiveness

Gram-positive bacteria

CPC is a effective against common Gram-positive bacteria, such as a range of types of Staphylococci and Streptococci, including the pathogens Staphylcococcus aureus and Streptococcus pyogenes.[1,2,3,4] It is also reported be to be effective against Listeria[5] in foodstuffs. As a general rule, actively-growing Gram-positive bacterial cells are sensitive to CPC and are rapidly killed (bactericidal) at relatively low concentration (at around 15 mg/L) and may be inhibited (bacteriostatic) at even lower CPC concentrations.

Mycobacteria

CPC is effective against mycobacteria when used at high concentration. Mycobacteria are relatively insensitive to the effects of most quaternary ammonium compounds, including CPC. This specialized group of Gram-positive bacteria – which includes the pathogens responsible for tuberculosis and leprosy – has cells with tough, waxy walls which make them more difficult to inactivate.[2,6,7]

Spore-forming (Gram-positive) bacteria

CPC and similar quaternary ammonium compounds are not effective in killing bacterial spores, however, they can be highly effective in preventing their growth. CPC is sporistatic rather than sporicidal since it inhibits the outgrowth of the bacterial spore during germination.[8]

Effectiveness continued

Gram-negative bacteria

CPC is somewhat less effective against common Gram-negative bacteria than it is against Gram-positive bacteria. For most Gram-negative bacteria, the amount required is an average of 25 mg/L.[1,2,3] A notable exception is Pseudomonas, a common aquatic environmental Gram-negative bacterium, which is especially insensitive to the effects of CPC, requiring up to 172 mg/L to provide a lethal concentration[2,13,14]. It is generally recognized that Gram-negative bacteria are moderately sensitive to quaternary ammonium compounds, including CPC[6]. The effectiveness can be increased by the use of a chelating agent such as EDTA.[9]

Other microbes

CPC is effective against other microbes, mostly yeast-like and filamentous fungi.[1,10] CPC is typically effective at a use level of approximately 14 mg/L in use, the antifungal effects of quaternary ammonium compounds such as CPC are generally regarded as fungistatic.

It is generally accepted that CPC, as well as other quaternary ammonium compounds, are less effective against viruses without an outer envelope (bacteriophage F116 and human non-enveloped viruses such as the human enteroviruses and rhinoviruses) than to enveloped viruses (Herpes viruses, HIV and Hepatitis B Virus).[11,12]

Why use Vertellus' Cetylpyridinium Chloride?

- **Vertellus offers high purity Cetylpyridinium Chloride which meets the latest USP monograph standards**
- **We have capability for adequate supply to minimize disruption to our customers' production and ultimately our customers' product sales**
- **We offer a liquid version for ease and safety of handling, thereby, allowing for a full manufacturing footprint**
- **We manufacture Cetylpyridinium Chloride in the USA and make it available globally**

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- As the leading global supplier of DEET, we play a critical role in reducing the spread of vector borne disease worldwide
- We enable our customers to improve medical technology and patient wellbeing with biocompatible solutions
- We are committed to investing in technologies and processes that promote long-term energy efficient operations and sustainable processing

Vertellus is dedicated to becoming the preferred global supplier of specialty ingredients and innovative materials that enhance quality of life, support health and wellness, and enable customers to deliver value-added solutions.

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