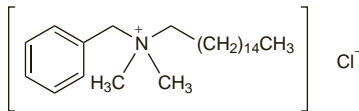


Cetalkonium Chloride (BAN, USAN, rINN)

Cetalkonii Chloridum; Cétalkonium; Chlorure de; Cloruro de cetalconio; NSC-32942. Benzylhexadecyldimethylammonium chloride.

Цеталкония Хлорид
C₂₅H₄₆ClN = 396.1.
CAS — 122-18-9.

**Profile**

Cetalkonium chloride is a quaternary ammonium antiseptic with actions and uses similar to those of other cationic surfactants (see Cetrimide, p.1634). It is used in a variety of topical preparations in the treatment of minor infections of the mouth and throat. It has also been used in the treatment of eye infections. Cetalkonium bromide has also been used.

Preparations

Proprietary Preparations (details are given in Part 3)

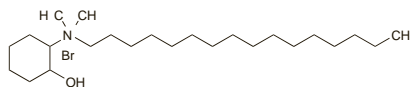
Multi-ingredient: **Arg.:** Pansoral; **Austral.:** Bonjela; **Austria:** Mundisal; **Braz.:** Pondicilina; **Canada:** Bionet; **Cz.:** Mundisal; **Fr.:** Pansoral; **Ger.:** Mundisal; **Gr.:** Mundisal; **Hong Kong:** Bonjela; **Hung.:** Mundisal; **Irl.:** Bonjela; **Israel:** Baby Gum; Bonjela; **Malaysia:** Bonjela; **NZ:** Bonjela; **Pol.:** Sachol zel Stomatologiczny; **Rus.:** Cholisal (Холисал); Pansoral (Пансорал); **S.Afr.:** AAA†; Bonjela; **Singapore:** Bonjela; **Switz.:** Mundisal; Pansoral; Tenderdol; **Thai.:** Bonjela; **UK:** Bonjela; Bonjela Teething Gel; **USA:** Babebe.

Cethexonium Bromide

Cetexonio, bromuro de. Hexadecyl(2-hydroxycyclohexyl)dimethylammonium bromide.

C₂₄H₅₀BrNO = 448.6.

CAS — 6810-42-0 (cethexonium); 1794-74-7 (cethexonium bromide); 58703-78-9 (cethexonium chloride).



NOTE. Cethexonium Chloride is rINN.

Profile

Cethexonium bromide is a quaternary ammonium antiseptic with properties similar to those of other cationic surfactants (see Cetrimide, p.1634). It is used in preparations for the local treatment of minor infections of the eye, nose, and throat.

Preparations

Proprietary Preparations (details are given in Part 3)

Fr.: Biocidan.

Multi-ingredient: **Fr.:** Biocidan.

Cetrimide (BAN, rINN)

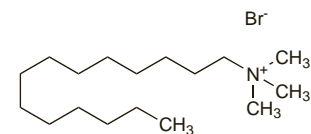
Cetrimid; Cetrimida; Cetrimidas; Cétrimide; Cetrimidium; Cetrymid; Setrimidi; Setrimidi.

Цетримид

CAS — 1119-97-7 (trimethyltetradecylammonium bromide); 1119-94-4 (dodecyltrimethylammonium bromide); 8044-71-1 (cetrimide).

ATC — D08AJ04; D11AC01.

ATC Vet — QD08AJ04; QD11AC01.



(trimethyltetradecylammonium bromide)

NOTE. The name cetrimonium bromide was often formerly used for cetrimide. Cetrimonium bromide (see below) is hexadecyltrimethylammonium bromide.

Pharmacopoeias. In *Eur.* (see p.vii) and *Int.*

Br. also includes strong cetrimide solution.

Ph. Eur. 6.2 (Cetrimide). It consists of trimethyltetradecylammonium bromide (=tetradonium bromide (rINN)) and may contain smaller amounts of dodecyltrimethylammonium bromide and hexadecyltrimethylammonium bromide (=cetrimonium bromide, p.1635). A white or almost white, voluminous, free-flow-

ing powder. Freely soluble in water and in alcohol. A 2.0% solution in water froths copiously when shaken.

BP 2008 (Strong Cetrimide Solution). It is an aqueous solution of cetrimide. It contains 20 to 40% w/v of cetrimide, calculated as C₁₇H₃₈BrN and up to 10% alcohol or isopropyl alcohol, or both; alcohol may be replaced by industrial methylated spirit. It may be perfumed and may contain colouring matter. Store at a temperature above 15°.

Incompatibility. Cetrimide is incompatible with soaps and other anionic surfactants, bentonite, iodine, phenylmercuric nitrate, and alkali hydroxides. Aqueous solutions react with metals.

Adverse Effects and Treatment

At the concentrations used on the skin, solutions of cetrimide and other quaternary compounds do not generally cause irritation, but some patients become hypersensitive to cetrimide after repeated applications. Cetrimide powder is reported to be irritant. There have been rare reports of burns with concentrated solutions of cetrimide.

If ingested, cetrimide and other quaternary ammonium compounds cause nausea and vomiting; strong solutions may cause oesophageal damage and necrosis. They have depolarising muscle relaxant properties and toxic symptoms include dyspnoea and cyanosis due to paralysis of the respiratory muscles, possibly leading to asphyxia. CNS depression (sometimes preceded by excitement and convulsions), hypotension, coma, and death may also occur. Accidental intra-uterine or intravenous administration may cause haemolysis and pulmonary embolism.

Treatment of poisoning is symptomatic; demulcents and diluents may be given if necessary but emesis and lavage should be avoided, particularly if concentrated solutions have been ingested. Activated charcoal may be considered if the patient presents within an hour of ingestion. CNS stimulants and cholinesterase inhibitors are reported not to reverse paralysis due to cetrimide intoxication although sympathomimetics have been tried. Corticosteroids may reduce oropharyngeal oedema.

Effects after cyst irrigation. Adverse effects after irrigation with cetrimide solutions in the treatment of hydatid cysts have included chemical peritonitis,¹ methaemoglobinaemia with cyanosis,² and metabolic acidosis.³

1. Gilchrist DS. Chemical peritonitis after cetrimide washout in hydatid-cyst surgery. *Lancet* 1979; **ii**: 1374.
2. Baraka A, et al. Cetrimide-induced methaemoglobinaemia after surgical excision of hydatid cyst. *Lancet* 1980; **ii**: 88-9.
3. Momblano P, et al. Metabolic acidosis induced by cetrimonium bromide. *Lancet* 1984; **ii**: 1045.

Poisoning. The fatal dose of quaternary ammonium compounds was estimated to be 1 to 3 g.¹

1. Arena JM. Poisonings and other health hazards associated with use of detergents. *JAMA* 1964; **190**: 56-8.

Precautions

Prolonged and repeated applications of cetrimide to the skin are inadvisable as hypersensitivity may occur. Contact with the eyes, brain, meninges, and middle ear should be avoided. Cetrimide is for external use only and should not be used in body cavities or as an enema.

Quaternary ammonium compounds are not reliable for sterilising surgical instruments and heat-labile articles. The antimicrobial activity of quaternary ammonium compounds may be reduced through absorption, or through combination with organic matter, or by reducing pH.

Solutions of quaternary ammonium compounds should not be used for disinfection of soft contact lenses.

Aqueous solutions of cetrimide or other quaternary ammonium disinfectants may be susceptible to contamination with micro-organisms. To reduce this risk, a sterilised preparation should be used or, where necessary, solutions must be freshly prepared at the recommended concentration and appropriate measures should be taken to prevent contamination during storage or dilution.

Handling. Cetrimide powder is irritant; it has been recommended that the nose and mouth should be protected by a mask when working with the powder¹ and eyes should be protected by goggles.

1. Jacobs JY. Work hazards from drug handling. *Pharm J* 1984; **233**: 195-6.

Uses and Administration

Cetrimide is a quaternary ammonium antiseptic with actions and uses typical of cationic surfactants. These surfactants dissociate in aqueous solution into a relatively large and complex cation that is responsible for the surface activity and a smaller inactive anion. In addition to emulsifying and detergent properties, quaternary ammonium compounds have bactericidal activity against Gram-positive and, at a higher concentration, against some Gram-negative bacteria. Some *Pseudomonas* spp. are particularly resistant as are strains of *Mycobacterium tuberculosis*. They are ineffective against bacterial spores, have variable antifungal activity, and are effective against some viruses.

Quaternary ammonium compounds are most effective in neutral or slightly alkaline solution and their bactericidal activity is appreciably reduced in acid media; their activity is enhanced by alcohols.

Like other quaternary ammonium compounds, notably benzalkonium chloride (p.1629), cetrimide has been employed for cleansing skin, wounds (but see under Wound Disinfection, p.1624), and burns. For these purposes it has been used as a 0.1 to 1.0% aqueous solution, generally prepared by dilution of a more concentrated solution, or as a cream or spray containing 0.5%. However, a mixture of cetrimide with chlorhexidine (p.1635) has often been preferred to cetrimide alone. This combination is also used in a lotion for acne (p.1577).

Solutions containing up to 10% of cetrimide have been used as shampoos to remove the scales in seborrhoeic dermatitis (p.1584).

Cetrimide solution 0.5 or 1% has been used as a scolicide to irrigate hydatid cysts during surgery (see Echinococcosis, p.136) but systemic adverse effects have been reported (see above).

Cetrimide and benzalkonium chloride are also used as preservatives in cosmetics and pharmaceutical formulations including eye drops and in disinfecting solutions for hard contact lenses; neither compound should be used for disinfection of soft contact lenses.

Cetrimide is also present in some emulsifying preparations such as Cetrimide Emulsifying Ointment (BP 2008).

Preparations

BP 2008: Cetrimide Cream; Cetrimide Emulsifying Ointment; Cetrimide Solution.

Proprietary Preparations (details are given in Part 3)

Arg.: Boucren; **Sorbicet:** **Fr.:** Cetavlon; **Sterilene:** **Gr.:** Cetavlon; **Irl.:** Cetavlex†; **Vesagex:** **Malaysia:** Cetavlex†; **Demoplex Antiseptic:** **Port:** Cetavlex; **Singapore:** Acnederim Wash; **Spain:** Cetavlon†; **Turk.:** Cetyl; **UK:** Banson†; Cetavlex; Medi-Prep; Medicaid; Richmond Antiseptic Cream; Vesagex.

Multi-ingredient: **Arg.:** Cerosporin GS†; Jabonacid; Otidrops; Otolcalmia Biotic; Sincerum; **Austral.:** Acnederim Foaming Wash; Curacleanse†; Dimethicream; Hamilton Pine Tar with Menthol; Hamilton Skin Repair†; Medi Creme; Microshield Antiseptic; Pro-PS†; Savlon Antiseptic; Soov Bite; Soov Burn; Soov Cream; **Austria:** Lemocin; Xylonor; **Belg.:** Lemocin; **Braz.:** Cetrilan; **Canada:** Savlodil; **Cz.:** Hibicet Hospital Concentrate†; **Fr.:** Broncorinol rhinites†; Lysocalmspray; Rectoquotane; **Gr.:** Hibicet; **Hong Kong:** Acnederim Wash; B-Gel; Borraginol-N; Drapolene†; Hamilton Skin Repair; Hibicet Hospital Concentrate†; Medicream; Soov Bite; Soov Cream; Tri-Gel; Zinsomine; **India:** Iteol-3; Scabine; Scarab; Siloderm; **Indon.:** Benzomid; Bioacne; Borraginol-N; Borraginol-S; Neo Resiguard; Pravlon; **Irl.:** Ceane†; Drapolene; Hibicet; RBC; Savlon; Siopel†; Torbetol; **Israel:** Cetrin; Savor; Septacare†; Tisept; Travasept; **Ital.:** Baxidin; Cetrexidin; Cetrisan; Clotramid†; Cuprosodio; Farvicett; Hibizene; Lidocaina Spray; Panseptil; Steridol†; **Malaysia:** Acnederim Foaming Wash; Burnol Plus; Drapolene; Hibicet†; Soov Bite; **Neth.:** Hibicet concentrate†; Hibicet verdupping; **NZ:** Acnederim Foaming Wash; Acnederim Wash†; Hairsience Conditioner†; Karicare Barrier Cream†; Medicream; Savlon; Soov Bite; Soov Burn; Soov Cream; Soov Gel; **Philipp.:** Drapolene; **Rus.:** Drapolene (Драполен); **S.Afr.:** Benzett†; Germolene; Hibicet†; Meditus†; Siopel; Trochain; Virobis†; **Singapore:** Burnol Plus; Drapolene; Napitol†; Savlon†; Soov Bite; Soov Cream; **Switz.:** Gem; **Thai.:** Bacard; Burnol Plus; Chlorhex-C; Dekka; Drapolene; Frebac; Hibicet†; Inhibac; Napilene; Sepidine†; Septone†; **Turk.:** Drapolene; Savlex; Savonol; Savrolin; Setilin; **UK:** Ceane†; Cetanorm; Cymex; Dermidex; Drapolene; Hibicet†; Lypsi; Cold Sore Gel; Neo Baby Cream; Quinoderm Antibacterial Face Wash; Savlon Antiseptic Cream; Savlon Antiseptic Liquid; Siopel; Steripod Chlorhexidine Gluconate with Cetrimide†; Tisept; Torbetol; Travasept; **USA:** Scadan.