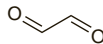


Melsitt; Minutil; Prontocid N†; Sekucid konz†; Sekusept Extra N; Sekusept forte S; Sekusept forte†; Spordis; Ultrason-F; Ital.; Bergon†; Citrosteril Im-pronte; Dianil†; Eso Dim; Esoform 92; Incidin Spezial; Melsept; Melsept SF; Sekucid; Sekumatic; Sekusept Extra N†; Thai.; Posequat with GA.

Glyoxal

Biformilol; Ethanedial; Glixal; Oxalaldehyde. 1,2-Ethanedione.
 $C_2H_2O_2 = 58.04$.
 CAS — 107-22-2.



Profile

Glyoxal is an aldehyde used for the disinfection of surfaces and of medical and surgical instruments.

Preparations

Proprietary Preparations (details are given in Part 3)

Thai.: Deconex 50FF†.

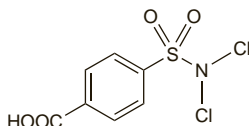
Multi-ingredient: Fr.: Aniospray 41; Bacterianos D†; Incidine†; Ger.: Buraton 10 F; Desoform†; Freka-Nol; Fugisept†; Incidin perfekt; Incidin Spezial; Incidur; Lysoformin 3000; Meliseptol; Melsept SF; Melsept†; Minutil†; Sekusept forte†; Ultrason-F; Ital.: Incidin Spezial; Indulfan; Melsept; Melsept SF; Melsept Spray.

Halazone (rINN)

Halazona; Halazonum; Pantocide. 4-(Dichlorosulphamoyl)benzoic acid.

Галазон

$C_7H_5Cl_2NO_4S = 270.1$.
 CAS — 80-13-7.



Pharmacopoeias. In US.

USP 31 (Halazone). A white crystalline powder with a characteristic odour of chlorine. Soluble 1 in more than 1000 of water and of chloroform, 1 in 140 of alcohol, and 1 in more than 2000 of ether; soluble in glacial acetic acid. It dissolves in solutions of alkali hydroxides and carbonates with the formation of a salt. Store in airtight containers. Protect from light.

Profile

Halazone is a disinfectant with the general properties of chlorine (p.1638) in aqueous solution and is used for the disinfection of drinking water (p.1623). It contains about 52% of 'available chlorine' (see p.1638). One tablet containing 4 mg of halazone, stabilised with sodium carbonate and sodium chloride, may be sufficient to treat about 1 litre of water in about 30 minutes to 1 hour. The taste of residual chlorine may be removed by adding sodium thiosulfate.

Preparations

USP 31: Halazone Tablets for Solution.

Proprietary Preparations (details are given in Part 3)

Ital.: Steridrola a rapida idrolisi†; Port.: Speton†.

Hexachlorophene (BAN, rINN)

G-11; Heksaklorofoeni; Hexachlorofen; Hexachlorophane; Hexachlorophène; Hexachlorophenum; Hexachlorofeno; Hexachlorofen. 2,2'-Methylenebis(3,4,6-trichloropheno).

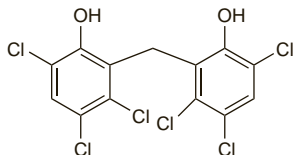
Гексахлорофен

$C_{13}H_6Cl_6O_2 = 406.9$.

CAS — 70-30-4.

ATC — D08AE01.

ATC Vet — QD08AE01; QP52AG02.



Pharmacopoeias. In Br and US.

BP 2008 (Hexachlorophene). A white or pale buff, odourless or almost odourless, crystalline powder. Practically insoluble in water; freely soluble in alcohol; very soluble in acetone and in ether. It dissolves in dilute solutions of alkali hydroxides. Protect from light.

USP 31 (Hexachlorophene). A white or light tan, crystalline powder which is odourless or has a slight phenolic odour. Insoluble in water; freely soluble in alcohol, in acetone, and in ether; soluble in chloroform and in dilute solutions of fixed alkali hydroxides. Store in airtight containers. Protect from light.

Incompatibility. The activity of hexachlorophene may be reduced in the presence of blood or other organic material. It retains some activity in the presence of soap.

The activity has been reported¹ to be reduced by alkaline media and by nonionic surfactants such as polysorbate 80. It is extremely sensitive to iron, and to avoid discoloration due to traces of this metal in hexachlorophene detergent solutions, it is advisable to incorporate a sequestrant such as disodium edetate.²

1. Walter G, Gump W. Effect of pH on hexachlorophene. *Soap Chem Spec* 1963; **39**: 55–6.

2. Bell M. Hexachlorophene-based skin cleansers. *Specialities* 1965; **1**: 16–18.

Adverse Effects and Treatment

After ingestion, anorexia, nausea, vomiting, diarrhoea, abdominal cramps, dehydration, shock, and confusion may occur. Convulsions and death may follow. CNS stimulation, convulsions, and death have also occurred after absorption of hexachlorophene from burns and damaged skin. There have been reports showing that hexachlorophene can be absorbed through the skin of infants in amounts sufficient to produce spongy lesions of the brain, sometimes fatal.

Photosensitivity and skin sensitisation have occasionally occurred after repeated use of hexachlorophene.

Treatment of adverse effects is as for Phenol, p.1656.

Effects on the respiratory system. Asthma developed in a 43-year-old nurse after long-term exposure to hexachlorophene powder.¹

1. Nagy L, Orosz M. Occupational asthma due to hexachlorophene. *Thorax* 1984; **39**: 630–1.

Precautions

Hexachlorophene should not be applied to mucous membranes, large areas of skin, or to burnt, damaged, or denuded skin and should not be used vaginally, applied under occlusive dressings, or applied to areas affected by dermatoses. It should be used with caution on infants, especially premature and low birth-weight neonates. Its use is not advised in pregnancy.

Preparations of hexachlorophene are liable to contamination, especially with Gram-negative bacteria.

Breast feeding. The American Academy of Pediatrics¹ considers that, while no effects on the infant have been reported, there is a possibility of contamination of breast milk with hexachlorophene used by breast-feeding mothers for nipple washing.

1. American Academy of Pediatrics. The transfer of drugs and other chemicals into human milk. *Pediatrics* 2001; **108**: 776–89. Correction. *ibid.*; 1029. Also available at: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3b108/3/776> (accessed 15/03/06)

Neonates. Spongiform encephalopathy has occurred in neonates who were treated topically with hexachlorophene.¹ Neonates with a birth-weight of 1.4 kg or less appeared to be most susceptible, whereas those weighing over 2 kg were not considered to be at risk.^{1,2} Also most of the reports involved hexachlorophene applied in a concentration of 3%.

1. Anonymous. Hexachlorophene today. *Lancet* 1982; **i**: 87–8.
 2. Plueckhahn VD, Collins RB. Hexachlorophene emulsions and antisepic skin care of newborn infants. *Med J Aust* 1976; **1**: 815–19.

Pregnancy. Hexachlorophene is absorbed from the skin and crosses the placenta, but whether it has produced teratogenic effects is subject to debate.^{1,2} However, it is considered best to avoid its use during pregnancy.

1. Halling H. Suspected link between exposure to hexachlorophene and malformed infants. *Ann N Y Acad Sci* 1979; **320**: 426–35.
 2. Baltzar B, *et al.* Pregnancy outcome among women working in Swedish hospitals. *N Engl J Med* 1979; **300**: 627–8.

Pharmacokinetics

Hexachlorophene is absorbed from the gastrointestinal tract after accidental ingestion, and through intact and denuded skin. Percutaneous absorption may be significant in premature infants and through damaged skin. Hexachlorophene crosses the placenta.

Uses and Administration

Hexachlorophene is a chlorinated bisphenol antiseptic with a bacteriostatic action against Gram-positive organisms, but much less effective against Gram-negative organisms. It is most active at pH 5 to 6.

Hexachlorophene is mainly used in soaps and creams in a concentration of 0.23 to 3% and is an ingredient of various preparations used for skin disorders. After repeated use of these preparations for several days there is a marked diminution of the bacterial flora due to accumulation of hexachlorophene in the skin. This residual effect is rapidly lost after washing with unmedicated soap or alcohol.

A preparation containing 3% is used for the disinfection of the hands of surgeons and other health-care personnel. Thorough rinsing is recommended before drying. Hexachlorophene has been applied as a 0.33% dusting powder to the umbilical cord stump for the control of staphylococcal infection in the newborn. However, care is necessary when using hexachlorophene in neonates (see above).

Hexachlorophene sodium has also been used.

Disinfection. Eradication of an outbreak of infection with methicillin-resistant *Staphylococcus aureus* in a neonatal intensive care unit was achieved by use of hexachlorophene soap for hand washing. Previous infection-control measures including the use of chlorhexidine had failed.¹ For a discussion of staphylococcal infections and their treatment, see p.195.

1. Reboli AC, *et al.* Epidemic methicillin-gentamicin-resistant *Staphylococcus aureus* in a neonatal intensive care unit. *Am J Dis Child* 1989; **143**: 34–9.

Preparations

BP 2008: Hexachlorophene Dusting Powder;

USP 31: Hexachlorophene Cleansing Emulsion; Hexachlorophene Liquid Soap.

Proprietary Preparations (details are given in Part 3)

Cz.: Aknefug-Simplex†; Ger.: Aknefug-simplex†; Indon.: Dermisan; Switz.: Acne-Med Wolff Simplex†; UK: Ster-Zac†; USA: Septisol†; Venez.: Solu-Hex.

Multi-ingredient: Braz.: Micosan†; Canad.: pH-Iso-Hex; Cz.: Aknefug†; Hexadecyl†; Septonex; Ger.: Aknefug-Emulsion†; Hung.: Phlogosol; Indon.: Topicide; Irl.: Torbetol; Israel: Acnex†; Port.: Anacal; Spain: Cresophene; Switz.: Acerbine†; Thai.: Cibis; USA: pH-Iso-Hex; Venez.: Permucal.

Hexamidine Isetionate (BAN, rINN)

Heksamidino diizetionatas; Hexamidin-diizetionát; Hexamidin-diizetionát; Hexamidine Diisetonate; Hexamidine, diisetonate d; Hexamidine Isethionate; Hexamidine, Isetionate d; Hexamidini diisetonas; Hexamidini Isetionas; Isetionato de hexamidina. 4,4'-(Hexamethylenedioxy)dibenzamidine bis(2-hydroxyethanesulphonate).

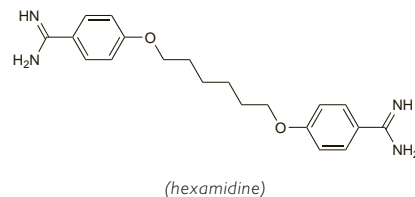
Гексамидина Изетionato

$C_{30}H_{26}N_4O_6 \cdot 2C_2H_5O_2S = 606.7$.

CAS — 3811-75-4 (hexamidine); 659-40-5 (hexamidine isetionate).

ATC — D08AC04; R01AX07; R02AA18; S01AX08; S03AA05.

ATC Vet — QD08AC04; QR01AX07; QR02AA18; QS01AX08; QS03AA05.



NOTE. The name Hexamidinum has been used for primidone (p.503).

Pharmacopoeias. In Eur. (see p.vii).

Ph. Eur. 6.2 (Hexamidine Diisetonate; Hexamidine Isetionate BP 2008). A white or slightly yellow hygroscopic powder. Sparingly soluble in water; slightly soluble in alcohol; practically insoluble in dichloromethane. Store in airtight containers.

Profile

Hexamidine isetionate has antibacterial and antifungal properties and is available in preparations for the local treatment of minor infections.

Acanthamoeba keratitis. Hexamidine was suggested¹ as a possible alternative to propamidine for the treatment of *Acanthamoeba keratitis* (p.822) due to the poor cysticidal activity, chronic conjunctival infection, and resistance of some *Acanthamoeba* strains seen with propamidine.^{1,2} Cures have been reported with 0.1% hexamidine used either as monotherapy^{2,3} or with polihexanide.²

1. Perrine D, *et al.* Amoebicidal efficiencies of various diamidines against two strains of *Acanthamoeba* polyphaga. *Antimicrob Agents Chemother* 1995; **39**: 339–42.