7. Of these, 4 developed neurotoxicity immediately; in the other 3 it did not develop for between 6 and 48 hours. The duration varied. One patient did not improve, one made a partial recovery, a third took 6 weeks to recover, another took 5 days; yet 2 patients recovered within 1′ to 2′ hours while the final patient experienced only transient effects.

1. Hahn AF, *et al.* Paraparesis following intrathecal chemotherapy. *Neurology* 1983; **33:** 1032–8.

Hypersensitivity. Hypersensitivity reactions to benzyl alcohol have been reported.[1-3]

1. Grant JA, *et al.* Unsuspected benzyl alcohol hypersensitivity. *N Engl J Med* 1982; **306:** 108.
2. Shmunes E. Allergic dermatitis to benzyl alcohol in an injectable solution. *Arch Dermatol* 1984; **120:** 1200–1.
3. Wilson JP, *et al.* Parenteral benzyl alcohol-induced hypersensitivity reaction. *Drug Intell Clin Pharm* 1986; **20:** 689–91.

Neonates. During 1981 and 1982 reports were published from 2 centres in the USA[1-3] of 20 deaths in low-birth-weight neonates attributed to the use of benzyl alcohol as a preservative in solutions used to flush their umbilical catheters and in some cases also to dilute their medication. The neonates suffered a toxic syndrome whose features included metabolic acidosis, symptoms of progressive encephalopathy, intracranial haemorrhage, and respiratory depression with gasping.

These deaths prompted the FDA[4] to recommend that benzyl alcohol should not be used in such flushing solutions; sodium chloride injection 0.9% without preservative should be used instead. The FDA had also advised against the use of benzyl alcohol or any preservative in fluids being used for the dilution or reconstitution of medicines for the newborn.

Those reporting the deaths[2,3] considered that the toxic syndrome could have been caused by the accumulation of the benzoic acid metabolite of benzyl alcohol, which could not be handled effectively by the immature liver; given the very low weight of the neonates they would have been receiving a comparatively high dose of benzyl alcohol. In commenting on the problem, the American Academy of Pediatrics[5] agreed that the FDA's warning was warranted, but pointed out that there was no evidence from controlled studies to confirm that benzyl alcohol was responsible.

1. Gershanik JJ, *et al.* The gasping syndrome: benzyl alcohol (BA) poisoning? *Clin Res* 1981; **29:** 895A.
2. Brown WJ, *et al.* Fatal benzyl alcohol poisoning in a neonatal intensive care unit. *Lancet* 1982; **i:** 1250.
3. Gershanik J, *et al.* The gasping syndrome and benzyl alcohol poisoning. *N Engl J Med* 1982; **307:** 1384–8.
4. Anonymous. Benzyl alcohol may be toxic to newborns. *FDA Drug Bull* 1982; **12:** 10–11.
5. American Academy of Pediatrics. Benzyl alcohol: toxic agent in neonatal use. *Pediatrics* 1983; **72:** 356–7.

Pharmacokinetics

Benzyl alcohol is metabolised to benzoic acid. This is conjugated with glycine in the liver to form hippuric acid which is excreted in the urine. Benzaldehyde and benzoic acid are degradation products *in vitro*.

Uses

Benzyl alcohol is used as an antimicrobial preservative. It is bacteriostatic mainly against Gram-positive organisms and some fungi. It is used in a range of pharmaceutical preparations in concentrations up to 2%. Concentrations of 5% or more are employed when it is used as a solubiliser. Benzyl alcohol is used as a preservative in foods and cosmetics. It is also used as a disinfectant at a concentration of 10%.

In addition to its antiseptic properties, concentrations of benzyl alcohol of up to 10% possess weak local anaesthetic and antipruritic activity.

Preparations

Proprietary Preparations (details are given in Part 3)
Canad.: Babys Own Teething Gel†; Zilactin Cold Sore Gel; ***USA:*** Zilactin.

Multi-ingredient: ***Arg.:*** Standard XXI; ***Austral.:*** Coso; Soothe'n Heal; ***Austria:*** Dermaspray; ***Belg.:*** Dermaspray†; Purigel Crisp; Purigel NF; ***Chile:*** Aucusik; Medikem†; Medisept†; ***Denm.:*** Doloproct Comp; ***Fr.:*** Biseptine; Codotussyl Maux de Gorge; Dermaspraid Antiseptique; Pastilles Medicinales Vicks; ***Ger.:*** Autoderm Extra; Gelipur; Spitacid; ***India:*** Dicloran MS; ***Israel:*** Otomycin; ***Ital.:*** Borocaina; Foille Scottature; Foille Sole; Pitiren; Prurex; Skab 2; ***Singapore:*** Saak†; ***Spain:*** Acerbiol; Pastillas Antisep Garg M; ***UK:*** Sudocrem; ***USA:*** Itch-X; MouthKote O/R; Oragesic; Super Ivy Dry; Topic; Tucks.

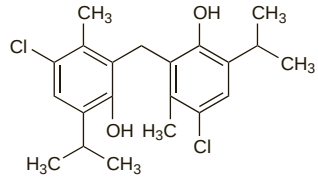
Used as an adjunct in: ***Jpn:*** Panpurol†.

Biclotymol *(rINN)*

Biclotimol; Biclotymolum. 2,2′-Methylenebis(6-chlorothymole).

Биклотимол

$C_{21}H_{26}Cl_2O_2$ = 381.3.
CAS — 15686-33-6.



Profile

Biclotymol is a phenolic antiseptic that is used in lozenges and sprays for mouth and throat infections. It is also an ingredient of cough preparations.

Preparations

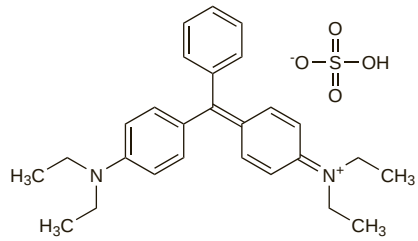
Proprietary Preparations (details are given in Part 3)
Cz.: Hexaspray†; ***Fr.:*** Hexaspray; Humex; Rhinathiol maux de gorge†; Sagadreps†; Sagaspray; Solutricine Maux de Gorge; ***Hong Kong:*** Hexaspray; ***Port.:*** Hexaspray; ***Rus.:*** Hexaspray (Гексаспрей).

Multi-ingredient: ***Fr.:*** Hexalyse; Hexapneumine; Hexarhume; ***Hong Kong:*** Hexalyse; Hexapneumine; ***Rus.:*** Hexalyse (Гексализ).

Brilliant Green

CI Basic Green 1; Colour Index No. 42040; Diamond Green G; Emerald Green; Ethyl Green; Malachite Green G; Solid Green; Verde brillante; Viride Nitens. 4-(4-Diethylaminobenzhydrylidene)cyclohexa-2,5-dien-1-ylidenediethylammonium hydrogen sulphate.

$C_{27}H_{34}N_2O_4S$ = 482.6.
CAS — 633-03-4.



NOTE. The name Emerald Green has also been used for copper acetoarsenite.

Profile

Brilliant green is a triphenylmethane antiseptic dye with actions similar to those of methylrosanilinium chloride (p.1653). Its activity is greatly reduced in the presence of serum.

A gel containing brilliant green 0.5% with lactic acid was formerly used in the treatment of skin ulcers.

An alcoholic solution of brilliant green 0.5% and methylrosanilinium chloride 0.5% (Bonney's Blue) was formerly used for disinfecting the skin, but concern over evidence of *animal* carcinogenicity with methylrosanilinium chloride has led to a decline in its use. A solution of the two disinfectants has been used for marking incisions before surgery.

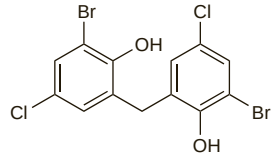
There have been occasional reports of sensitivity to brilliant green.

Adverse effects. For a report of necrotic skin reactions after application of a 1% solution of brilliant green to stripped skin, see under the Adverse Effects of Methylrosanilinium Chloride, p.1653.

Bromchlorophen

Bromchlorophene; Bromochlorophane; Bromoclorofeno. 2,2′-Methylenebis[6-bromo-4-chlorophenol].

$C_{13}H_8Br_2Cl_2O_2$ = 426.9.
CAS — 15435-29-7.



Profile

Bromchlorophen is a halogenated bisphenol antiseptic more active against Gram-positive than Gram-negative bacteria. It is used for disinfection of the hands and skin. It has also been used in deodorants and toothpastes.

Preparations

Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Ger.:*** Dibromol.

Bromsalans

Bromosalicilanilidas.
CAS — 55830-61-0.

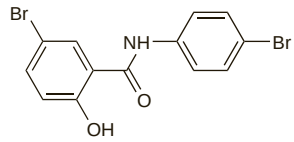
Description. Bromsalans are a series of brominated salicylanilides that possess antimicrobial activity.

Dibromsalan *(USAN, pINN)*

Dibromsalán; Dibromsalanum; NSC-20527. 4′,5-Dibromosalicylanilide; 5-Bromo-*N*-(4-bromophenyl)-2-hydroxybenzamide.

Дибромсалан

$C_{13}H_9Br_2NO_2$ = 371.0.
CAS — 87-12-7.

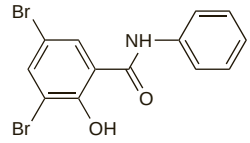


Metabromsalan *(USAN, pINN)*

Métabromsalan; Metabromsalán; Metabromsalanum; NSC-526280. 3,5-Dibromosalicylanilide; 3,5-Dibromo-2-hydroxy-*N*-phenylbenzamide.

Метабромсалан

$C_{13}H_9Br_2NO_2$ = 371.0.
CAS — 2577-72-2.

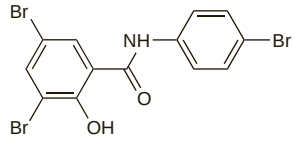


Tribromsalan *(BAN, USAN, rINN)*

ET-394; NSC-20526; TBS; Tribromsalán; Tribromsalanum. 3,4′,5-Tribromosalicylanilide; 3,5-Dibromo-*N*-(4-bromophenyl)-2-hydroxybenzamide.

Трибромсалан

$C_{13}H_8Br_3NO_2$ = 449.9.
CAS — 87-10-5.



Profile

Bromsalans have antibacterial and antifungal activity and have been used in medicated soaps, but there have been many reports of photosensitivity arising from this use.

Preparations

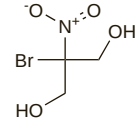
Proprietary Preparations (details are given in Part 3)
Ital.: Bergamon Sapone.

Bronopol *(BAN, rINN)*

Bronopolum. 2-Bromo-2-nitropropane-1,3-diol.

Бронопол

$C_3H_6BrNO_4$ = 200.0.
CAS — 52-51-7.
ATC Vet — QD01AE91.



Pharmacopoeias. In *Br.* and *Pol.*
BP 2008 (Bronopol). White or almost white crystals or crystalline powder, odourless or almost odourless. Freely soluble in