

Deoxyribonucleic Acid

ADN; Animal Nucleic Acid; Desoxirribonucleico, ácido; Desoxy-pentose Nucleic Acid; Desoxyribonucleic Acid; Desoxyribose Nucleic Acid; DNA; Thymus Nucleic Acid.

ДНК; Дезоксирибонуклеиновая Кислота

Profile

Deoxyribonucleic acid (DNA) is a nucleic acid (p.2355) in which the pentose sugar moiety of the nucleotides is deoxyribose, the purine bases are adenine (p.2247) and guanine, and the pyrimidine bases are cytosine and thymine. Hydrogen bonds between complementary pairs of purine and pyrimidine bases link 2 polynucleotide strands, which are twisted to form a double helix with the bases on the inside of the structure and the sugar-phosphate backbone on the outside. Pairing of bases between complementary strands of DNA is always the same: adenine with thymine and cytosine with guanine. DNA is present in cell nuclei and its function is to carry the genetic material of cellular organisms and DNA viruses. It also provides the template for the production of ribonucleic acid (p.2379). For the role of DNA in gene therapy, see p.2310.

Proprietary preparations of DNA are marketed in some countries for a variety of debilitating and convalescent conditions; the sodium and magnesium salts of DNA have also been used.

Preparations

Proprietary Preparations (details are given in Part 3)

Arg.: ADN; **Ital.:** Placentex; **Rus.:** Деринат (Деринат).

Multi-ingredient: **Fr.:** Adena C†; **India:** Placentrex.

Dextran Sulfate (BANM, rINNM)

Dextran, Sulfate de; Dextran Sulfate Sodium; Dextran Sulphate; Dextran Sulphate Sodium; Dextran Sulphas; Sulfato de dextran.

Декстрана Сульфат

CAS — 9011-18-1.

ATC — B05AA05.

ATC Vet — QB05AA05.

Pharmacopoeias. In *Jpn.*

Profile

Dextran sulfate is the sodium salt of sulfuric acid esters of dextran. It has been used as an anticoagulant and as a lipid regulating drug, and has been investigated for its antiviral activity. Dextran sulfate potassium has also been used.

Interactions. As mentioned on p.1195 (under Hypersensitivity), anaphylactoid reactions have occurred in patients receiving ACE inhibitors during low-density lipoprotein apheresis using a dextran sulfate-cellulose column.^{1,2} Withdrawal of the ACE inhibitor for 1 to 3 days before apheresis may prevent the reaction.²

1. Olbricht CJ, *et al.* Anaphylactoid reactions, LDL apheresis with dextran sulphate, and ACE inhibitors. *Lancet* 1992; **340**: 908–9.
2. Agishi T. Anion-blood contact reaction (ABC reaction) in patients treated by LDL apheresis with dextran sulfate-cellulose column while receiving ACE inhibitors. *JAMA* 1994; **271**: 195–6.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: **Arg.:** Diroseal; **Austral.:** VR†; **Chile:** Cicapost; Diroseal; Ureadin Rx DB; **Cz.:** Doxivenil†; **Fr.:** Avene Antrougeurs; Creme au Mellilot Composee; Dextranrine Phenylbutazone; Diroseal; Prebutix; **Ger.:** Phlebodril N; **Hung.:** Doxivenil; **Ital.:** Stranoval; **Port.:** Cicapost; Doxivenil; **Switz.:** Doxivenil; **Venez.:** Doxivenil.

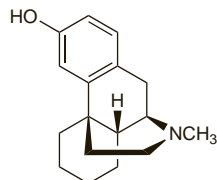
Dextrorphan (BAN, pINN)

Dextrorfanio; Dextrorphan; Dextrorphanum. 17-Methyl-9 α -13 α ,14 α -morphinan-3-ol.

Декстрорфан

C₁₇H₂₃NO = 257.4.

CAS — 125-73-5.

**Dextrorphan Hydrochloride** (BANM, USAN, pINNM)

Dextrorphan, Chlorhydrate de; Dextrorphani Hydrochloridum; Hidrocloruro de dextrorfanio; Ro-01-6794/706.

Декстрорфана Гидрохлорид

C₁₇H₂₃NO.HCl = 293.8.

CAS — 69376-27-8.

Profile

Dextrorphan, a metabolite of dextromethorphan (p.1555), is an antagonist of the excitatory neurotransmitter *N*-methyl-D-aspar-

tate (NMDA). It possesses some cough suppressant activity and has been investigated as a neuroprotective agent in the management of stroke.

References.

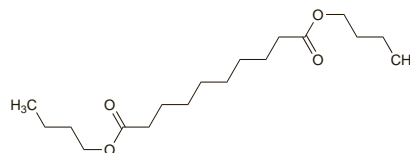
1. Albers GW, *et al.* Safety, tolerability, and pharmacokinetics of the *N*-methyl-D-aspartate antagonist dextrorphan in patients with acute stroke. *Stroke* 1995; **26**: 254–8.

Dibutyl Sebacate

Sebacato de dibutilo.

C₁₈H₃₄O₄ = 314.5.

CAS — 109-43-3.



Pharmacopoeias. In *USNF*.

USNF 26 (Dibutyl Sebacate). It consists of esters of *n*-butyl alcohol and saturated dibasic acids, principally sebacic acid. A colourless, oily liquid of very mild odour. Practically insoluble in water and in glycerol; soluble in alcohol, in isopropyl alcohol, and in liquid paraffin; very slightly soluble in propylene glycol. Store in airtight containers.

Profile

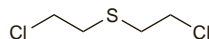
Dibutyl sebacate is a plasticiser used in pharmaceutical formulation of tablets (including modified release), beads, and granules, and microcapsule preparations. It is also used as a food flavouring.

Dichlorodiethylsulfide

Dichlorodiethylsulphide; Gas mostaza; Iperita; Mustard Gas; Sulfur Mustard; Sulfuro de dicloroetileno; Yellow Cross Liquid; Yperite. Bis(2-chloroethyl)sulphide.

C₄H₈Cl₂S = 159.1.

CAS — 505-60-2.

**Profile**

Dichlorodiethylsulfide was developed for use in chemical warfare and has even more severe vesicant and irritant properties than its nitrogen analogue, chloremethine (p.697). It was formerly used topically in the treatment of psoriasis.

Reviews of the toxicology of dichlorodiethylsulfide,¹⁻⁴ and debate on the management of casualties injured by dichlorodiethylsulfide and other chemical warfare agents,⁵⁻¹¹ Most patients exposed to dichlorodiethylsulfide recover largely or completely and only a small proportion will have severe long-term eye or lung damage,^{12,13} although death from respiratory, renal, and bone-marrow failure may occur.¹¹ A combination of 1% phenol and 1% menthol applied topically produced significant relief of pruritus compared with placebo in a randomised study of 80 war veterans with chronic skin lesions following exposure to dichlorodiethylsulfide.¹⁴

Eleven fishermen who accidentally retrieved corroded and leaking gas shells containing dichlorodiethylsulfide from underwater dumps, presented with very inflamed skin, especially in the axillary and genitofemoral regions, yellow blisters on the hands and legs, painful irritation of the eyes, and transient blindness. Two developed pulmonary oedema.¹⁵ There was evidence of a mutagenic effect and in view of the increased risk of lung cancer in soldiers and workers exposed to the gas it is reasonable to assume that fishermen heavily exposed to dichlorodiethylsulfide also have an increased cancer risk.

1. Smith KJ, *et al.* Sulfur mustard: its continuing threat as a chemical warfare agent, the cutaneous lesions induced, progress in understanding its mechanism of action, its long-term health effects, and new developments for protection and therapy. *J Am Acad Dermatol* 1995; **32**: 765–76.
2. Dacre JC, Goldman M. Toxicology and pharmacology of the chemical warfare agent sulfur mustard. *Pharmacol Rev* 1996; **48**: 289–326.
3. Kehe K, Szincz L. Medical aspects of sulphur mustard poisoning. *Toxicology* 2005; **214**: 198–209.
4. Balali-Mood M, Hefazi M. The pharmacology, toxicology, and medical treatment of sulphur mustard poisoning. *Fundam Clin Pharmacol* 2005; **19**: 297–315.
5. Heyndrickx A, Heyndrickx B. Management of war gas injuries. *Lancet* 1990; **ii**: 1248–9.
6. Fouyn T, *et al.* Management of chemical warfare injuries. *Lancet* 1991; **337**: 121.
7. Willems JL, *et al.* Management of chemical warfare injuries. *Lancet* 1991; **337**: 121–2.

8. Maynard RL, *et al.* Management of chemical warfare injuries. *Lancet* 1991; **337**: 122.

9. Newman-Taylor AJ, Morris AJR. Experience with mustard gas casualties. *Lancet* 1991; **337**: 242.

10. Heyndrickx A. Chemical warfare injuries. *Lancet* 1991; **337**: 430.

11. Rees J, *et al.* Mustard gas casualties. *Lancet* 1991; **337**: 430.

12. Murray VSG, Volans GN. Management of injuries due to chemical weapons. *BMJ* 1991; **302**: 129–30.

13. Khateri S, *et al.* Incidence of lung, eye, and skin lesions as late complications in 34 000 Iranians with wartime exposure to mustard agent. *J Occup Environ Med* 2003; **45**: 1136–43.

14. Panahi Y, *et al.* Phenol and menthol in the treatment of chronic skin lesions following mustard gas exposure. *Singapore Med J* 2007; **48**: 392–5.

15. Wulf HC, *et al.* Sister chromatid exchanges in fishermen exposed to leaking mustard gas shells. *Lancet* 1985; **i**: 690–1.

Digitalin

Amorphous Digitalin; Digitalina; Digitalinum Purum Germanicum.

NOTE. Distinguish from Digitaline Crystallisée (digitoxin, p.1259) which is very much more potent.

Profile

Digitalin is a standardised mixture of glycosides from *Digitalis purpurea*. It has actions similar to those of digoxin (p.1259). Because of its ready solubility in water it was formerly used for the preparation of solutions for injection. It is also present in some ophthalmic preparations.

Preparations

Proprietary Preparations (details are given in Part 3)

Ger.: Augentonikum N.

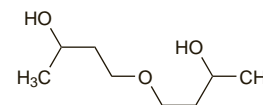
Multi-ingredient: **Ital.:** Digifar†.

Dihydroxydibutylether

Dihydroxidibutiléter; Hydroxybutyloxiide. 4,4'-Oxybis(butan-2-ol).

C₈H₁₈O₃ = 162.2.

CAS — 821-33-0.

**Profile**

Dihydroxydibutylether is a choleric.

Preparations

Proprietary Preparations (details are given in Part 3)

Ital.: Diskin†.

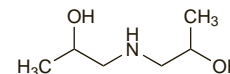
Multi-ingredient: **Arg.:** Binorex; Cistoquine Plus†; **Ital.:** Dis-Cinil Complex.

Diisopropanolamine

Diisopropanolamina. 1,1'-Iminobis(propan-2-ol).

C₆H₁₅NO₂ = 133.2.

CAS — 110-97-4.



Pharmacopoeias. In *USNF*.

USNF 26 (Diisopropanolamine). A mixture of isopropanolamines, consisting largely of diisopropanolamine. Store in airtight containers. Protect from light.

Profile

Diisopropanolamine is an organic base that is used as a neutralising agent in cosmetics and toiletries.

Dill

Aneth; Anethum; Eneldo.

NOTE. Indian Dill is the dried ripe fruits of *Anethum sowa*.

Pharmacopoeias. **Fr.:** includes dill fruit.

Profile

Dill (*Anethum graveolens*, Apiaceae) is a culinary herb and has also been used in herbal medicine. It is the source of dill oil (see below).

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: **Austral.:** Colax; **Fr.:** Calmosine†.

The symbol † denotes a preparation no longer actively marketed