Cyclodextrins

Ciclodextrinas.

Alfadex *(BAN, rINN)*

Alfadeksas; Alfadeksi; Alfadexum; Alpha Cyclodextrin; Alphacyclodextrin; α-Cyclodextrin; Cyclohexaamylose; Cyclomaltohexose. Cyclomaltohexaose.

Альфадекс

$C_{36}H_{60}O_{30}$ = 972.8.
CAS — 10016-20-3.

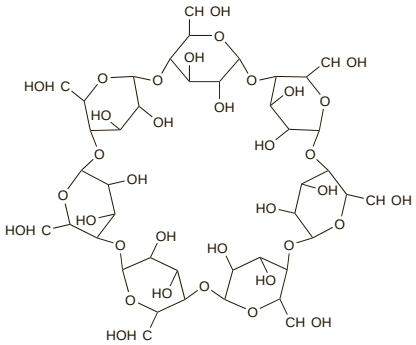
Pharmacopoeias. In *Eur.* (see p.vii). Also in *USNF.*
Ph. Eur. 6.2 (Alfadex). A white or almost white, amorphous or crystalline powder. Freely soluble in water and in propylene glycol; practically insoluble in dehydrated alcohol and in dichloromethane. Store in airtight containers.
USNF 26 (Alfadex). A white or almost white, amorphous or crystalline, powder. Freely soluble in water and in propylene glycol; practically insoluble in dehydrated alcohol and in dichloromethane. Store in airtight containers.

Betadex *(BAN, USAN, rINN)*

Beetadeksi; Betadeksas; Bétadex; Betadexum; β-Cyclodextrin; E459. Cyclo-α-(1→4)-D-heptaglucopyranoside.

Бетадекс

$C_{42}H_{70}O_{35}$ = 1135.
CAS — 7585-39-9.



Pharmacopoeias. In *Chin.* and *Eur.* (see p.vii). Also in *USNF.*
Ph. Eur. 6.2 (Betadex). A white or almost white, amorphous or crystalline powder. Sparingly soluble in water; practically insoluble in alcohol and in dichloromethane; freely soluble in propylene glycol. Store in airtight containers.
USNF 26 (Betadex). A nonreducing cyclic compound composed of seven alpha-(1-4) linked D-glucopyranosyl units. It is a white, practically odourless, fine crystalline powder. Soluble 1 in 54 of water. Store in airtight containers.

Hydroxypropylbetadex

Hidroksipropilbetadeksas; Hydoxipropylbetadex; Hydroksipropyylibetadeksi; Hydroxypropylbétadex; Hydroxypropylbetadexum; 2-Hydroxypropyl-β-cyclodextrin.

Pharmacopoeias. In *Eur.* (see p.vii). Also in *USNF.*
Ph. Eur. 6.2 (Hydroxypropylbetadex). A white or almost white, amorphous or crystalline powder. Freely soluble in water and in propylene glycol.
USNF 26 (Hydroxypropyl Betadex). A white or almost white, amorphous or crystalline powder. Freely soluble in water and in propylene glycol.

Profile

Cyclodextrins, such as alfadex and betadex, are produced by the enzymatic degradation of starch and are used as carrier molecules for drug delivery systems. Hydroxypropylbetadex, a derivative of betadex, is also used.

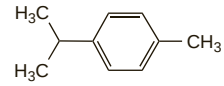
◊ References.

1. Ridgway K. Drug release rates: cyclodextrin complexes. *Pharm J* 1990; **245:** 344–5.
2. Szejtli J. Cyclodextrins: properties and applications. *Drug Invest* 1990; **2** (suppl 4): 11–21.
3. El Shaboury MH. Physical properties and dissolution profiles of tablets directly compressed with β-cyclodextrin. *Int J Pharmaceutics* 1990; **63:** 95–100.
4. Stella VJ, Rajewski RA. Cyclodextrins: their future in drug formulation and delivery. *Pharm Res* 1997; **14:** 556–67.
5. Loftsson T, Olafsson JH. Cyclodextrins: new drug delivery systems in dermatology. *Int J Dermatol* 1998; **37:** 241–6.
6. Redenti E, *et al.* Drug/cyclodextrin/hydroxy acid multicomponent systems: properties and pharmaceutical applications. *J Pharm Sci* 2000; **89:** 1–8.
7. Loftsson T, Masson M. Cyclodextrins in topical drug formulations: theory and practice. *Int J Pharm* 2001; **225:** 15–30.
8. Loftsson T, Stefansson E. Cyclodextrins in eye drop formulations: enhanced topical delivery of corticosteroids to the eye. *Acta Ophthalmol Scand* 2002; **80:** 144–50.
9. Dass CR. Cyclodextrins and oligonucleotide delivery to solid tumours. *J Drug Target* 2004; **12:** 1–9.
10. Kaur IP, *et al.* Role of cyclodextrins in ophthalmics. *Curr Drug Deliv* 2004; **1:** 351–60.
11. Challa R, *et al.* Cyclodextrins in drug delivery: an updated review. *AAPS PharmSciTech* 2005; **6:** E329–E357.

Cymene

Cimeno; *p*-Cymene; *p*-Cymol; p-Cymen. 4-Isopropyl-1-methylbenzene; 4-Isopropyltoluene.

$C_{10}H_{14}$ = 134.2.
CAS — 25155-15-1; 99-87-6 (p-cymene).



(p-cymene)

Profile

Cymene is used in perfumery. It has also been used as a topical local analgesic for the relief of pain in rheumatic conditions.

Cynara

Alcachofa; Alcachôfra; Artichaut; Artichaut, feuille d'; Artichoke Leaf; Artičokový list; Cynarae folium; Liść karczocha.

Pharmacopoeias. In *Eur.* (see p.vii).
Ph. Eur. 6.2 (Artichoke Leaf). The whole or cut, dried leaf of *Cynara scolymus.* It contains a minimum 0.8% of chlorogenic acid ($C_{16}H_{18}O_9$ = 354.3), calculated with reference to the dried drug. Protect from light.

Profile

Cynara, the leaf of the globe artichoke, *Cynara scolymus* (Compositae), is reputed to have diuretic and choleretic properties. It may also have some hypolipidaemic activity.

◊ References.

1. Joy JF, Haber SL. Clinical uses of artichoke leaf extract. *Am J Health-Syst Pharm* 2007; **64:** 1904–9.

Preparations

Proprietary Preparations (details are given in Part 3)
Arg.: Alcachofa Plus; Chofitol; Cynarex; ***Austria:*** Cynarix; Hepar-POS; ***Belg.:*** Cynarol; Hebucol; ***Braz.:*** Alcachofrax; Chophytol; ***Fr.:*** Chophytol; Gallexier†; Hepanephrol; ***Ger.:*** aar gamma N; Ardeycholan; Carminagal N†; Cefacynar; Cholagogum; Cyna Bilisan†; Cynacur; Cynalip duo†; Cynarix N†; Hepagallin N; Hepar SL; Hepar-POS; Heparstad†; Hewechol Artischockendragees; Lipei; Losapan†; Natu-Hepa; Naturreiner†; ratio-Hepar†; Valverde Artischocke†; ***Pol.:*** Cynacholin; Cynarex; Hepacynar; Liproxal; ***Port.:*** Hepanephrol†; ***Rus.:*** Chophytol (Хофитол); ***Switz.:*** Chophytol; Hepa-S; Natu-Hepa.

Multi-ingredient: ***Arg.:*** Arceligasol; Bagohepat; Bilidren; Biliosan Compuesto†; Boldina; Digenat; Dioxicolagol; HDG; Hepacur; Hepatalgina; Hepatodirectol; Herbaccion Dig Fresh†; Herbaccion Digestivo†; Lorbihepatic; Metiogen; Palatrobil; ***Austral.:*** Extralife Liva-Care; Lifesystem Herbal Formula 7 Liver Tonic†; Liver Tonic Herbal Formula 6†; Livstim†; Livton Complex†; ***Austria:*** Cynarix comp; ***Braz.:*** Alcafelol†; Alcaflor†; Chofranina; Colachofra; Composto Emagrecedor†; Digestron†; Emagrevit†; Figatil; Hecrosine B12†; Hepatoregius†; Jurubileno†; Lisotox; Olocynan†; Solvobil; ***Canad.:*** Milk Thistle; ***Cz.:*** Cynarosan†; ***Fr.:*** Actibil†; Benetransit; Canol; Elixir Spark; Hepaclem; Hepax; Vegelax†; ***Ger.:*** Bilicura Forte†; Carmol Magen-Galle-Darm; Cynarzym N†; Gallexier; Galloselect M†; Pascobilin novo†; ***Hong Kong:*** Hepatofalk; ***Indon.:*** Biocholes; ***Ital.:*** Cinarepa; Colax; Digelax†; Epagest†; Vadolax†; ***Malaysia:*** Dandelion Complex†; ***Mex.:*** Bagohepat; Chofabol; Hepedren; Ifuchol; ***Pol.:*** Cardiobonisol; Rapacholin AC; Rapacholin C; Sylicynar; ***Rus.:*** Herbion Drops for the Gallbladder (Гербион Капли Желчегонные); ***Spain:*** Cynaro Bilina; Lipograsil; Menabil Complex†; Nico Hepatocyn; ***Switz.:*** Bilifuge; Boldocynara; Demonatur Gouttes pour le foie et la bile; Heparfelien; Phytomed Hepato†; Stago N†; Strath Gouttes pour le foie et la bile; Tisane hepatique et biliaire; ***UK:*** Bio-Strath Artichoke Formula; ***Venez.:*** Cynascool.

Cynarine *(rINN)*

Cinarina; Cynarin; Cynarinum; Cynaryna; 1,5-Dicaffeoylquinic Acid. 1-Carboxy-4,5-dihydroxy-1,3-cyclohexylene bis(3,4-dihydroxycinnamate).

Цинарин

$C_{25}H_{24}O_{12}$ = 516.5.
CAS — 1182-34-9; 1884-24-8.

Profile

Cynarine is an active ingredient of cynara (above). It has been used as a choleretic.

Preparations

Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Arg.:*** HDG; ***Austria:*** Trommgallol.

Cypress

Italian Cypress; Mediterranean Cypress.

Profile

Italian or Mediterranean cypress (*Cupressus sempervirens*, Cupressaceae) is included in preparations for peripheral vascular disorders.

It is the source of cypress oil. Cypress oil is used in preparations for the relief of cough and cold symptoms and in aromatherapy.

Preparations

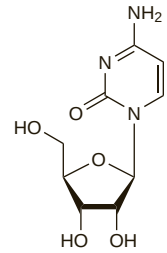
Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Fr.:*** Arterase; Circulatonic; Mediflor Tisane Circulation du Sang No 12; Veinostase; ***Ital.:*** Colostrum; Venalta; ***Port.:*** Solubeol†; ***Spain:*** Natusor Circusil†; Proctosor†; Ruscimel†; Trophires†; Vapores Pyt; ***Switz.:*** Eucapinol; Makaphyt Baume†; Novital.

Cytidine

Cytosine Riboside. 4-Amino-1-β-D-ribofuranosyl-2-(1*H*)-pyrimidinone.

Цитидин

$C_9H_{13}N_3O_5$ = 243.2.
CAS — 65-46-3.



Profile

Cytidine is an endogenous cytosine nucleoside involved in many biological processes; it is one of the components of nucleic acids (p.2355). Cytidine is used in preparations containing other nucleosides in the treatment of corneal damage. It has also been used in preparations for liver disorders, anaemias, and as a tonic. Disodium cytidine phosphate is included in preparations for neuralgia, neuritis, and myopathies and has also been used for peripheral and cerebral vascular disorders; the triphosphate has also been used.

Preparations

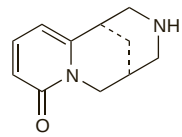
Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Arg.:*** Nucleo CMP†; ***Belg.:*** Vitacic; ***Braz.:*** Nucleo CMP; ***Chile:*** Citoneuron; ***Cz.:*** Laevadosin†; ***Ger.:*** Keltican N; ***Hung.:*** Vitacic†; ***Ital.:*** Centrum; ***Mex.:*** Nucleo CMP; ***Mon.:*** Vitacic; ***Rus.:*** Vitacic (Витасик)†; ***Spain:*** Cefabol; Nucleo CMP.

Cytisine

Baptitoxine; Laburnine; Sophorine; Ulexine. 1,2,3,4,5,6-Hexahydro-1,5-methano-8*H*-pyrido[1,2-*a*][1,5]diazocin-8-one.

Цитизин

$C_{11}H_{14}N_2O$ = 190.2.
CAS — 485-35-8.



Profile

Cytisine is a highly toxic alkaloid found in laburnum (p.2329) and some other leguminous plants. It resembles nicotine (p.2352) in its actions and has been given orally as an aid to smoking cessation (p.2354). The dose is 1.5 mg 6 times daily for 3 days which is then gradually reduced over the next 3 weeks to 1.5 to 3 mg daily for the final 5 days of treatment. Treatment of adverse effects of cytisine is as described for Nicotine, p.2352.

A 0.15% solution of cytisine known as Cytitone has been used intravenously or intramuscularly in some countries as a respiratory stimulant.

◊ References.

1. Etter J-F. Cytisine for smoking cessation: a literature review and a meta-analysis. *Arch Intern Med* 2006; **166:** 1553–9.
2. Tutka P, Zatoński W. Cytisine for the treatment of nicotine addiction: from a molecule to therapeutic efficacy. *Pharmacol Rep* 2006; **58:** 777–98.

Preparations

Proprietary Preparations (details are given in Part 3)
Bulg.: Tabex (Табекс); ***Hung.:*** Tabex†; ***Pol.:*** Tabex; ***Rus.:*** Tabex (Табекс).

Cytochrome C

Citocromo C.

Pharmacopoeias. *Chin*. includes Cytochrome C Solution and preparations for injection.

Profile

Cytochrome C is a haemoprotein occurring in the body and involved in electron and hydrogen transport in biological oxidation processes. It has been given intravenously in various hypoxic conditions.

Cytochrome C is an ingredient of some eye drops used for the treatment of cataract but its actions, if any, are unclear.

Preparations

Proprietary Preparations (details are given in Part 3)
Ital.: Citophase; ***Jpn:*** Cytorest.

Multi-ingredient: ***Rus.:*** Oftan Catachrom (Офтан Катахром); ***Spain:*** Vitaphakol.

Cytokines

Citocinas; Citokinas; Citoquinas.

Цитокины

Profile

Cytokines are a group of endogenous soluble peptides produced by many different cell types in response to noxious stimuli. In contrast to peptide hormones, they tend to act locally. Cytokines affect expression of genes influencing changes at the cellular level and have a regulatory function, acting as growth factors in cellular differentiation and/or proliferation. Cytokines are also involved in host responses to disease such as infection or inflammation. Some cytokines induce inflammation whereas others have an anti-inflammatory action through inhibition of proinflammatory cytokines. Cytokines are classified by their biological activity rather than structure and most are pleiotropic (i.e. they are multifunctional). A large number of cytokines alter endothelial function affecting permeability and may also cause cellular damage or death. Some cytokines are involved in the pathophysiology of diseases, particularly immune, inflammatory, and infectious diseases; they may also be involved in the development of cardiovascular disease.

Cytokines that are used clinically include:

- granulocyte colony-stimulating factors such as filgrastim (p.1070)
- granulocyte-macrophage colony-stimulating factors such as molgramostim (p.1073)
- interferons (p.885)
- some interleukins (p.2325)
- oprelvekin (p.1074), a platelet growth factor
- palifermin (p.2359), a keratinocyte growth factor
- somatomedins (p.1807)
- thrombopoietin (p.1080)
- trafermin (p.1618), a fibroblast growth factor
- tumour necrosis factor (p.783)
- urogastrone (p.1778), an epidermal growth factor

Anticytokine-based therapy may involve suppressing the action of single or related cytokines by specific soluble cytokine receptors, antagonists to the cytokine receptor, or antibodies against the cytokine. Alternatively, the synthesis of several unrelated cytokines may be suppressed by a single therapeutic agent. Fusion toxins in which protein sequences from cytokines or natural growth factors are combined with a bacterial toxin have also been produced to target specific cytokines.

◊ References.

1. Xing Z, Wang J. Consideration of cytokines as therapeutics agents or targets. *Curr Pharm Des* 2000; **6:** 599–611.
2. Schooltink H, Rose-John S. Cytokines as therapeutic drugs. *J Interferon Cytokine Res* 2002; **22:** 505–16.
3. Andreakos ET, *et al*. Cytokines and anti-cytokine biologicals in autoimmunity: present and future. *Cytokine Growth Factor Rev* 2002; **13:** 299–313.
4. Stevceva L. Cytokines and their antagonists as therapeutic agents. *Curr Med Chem* 2002; **9:** 2201–7.
5. Chung KF. Cytokines as targets in chronic obstructive pulmonary disease. *Curr Drug Targets* 2006; **7:** 675–81.
6. Villar CC, *et al*. Therapeutic modulation of cytokines in chronic infectious diseases. *Curr Pharm Des* 2006; **12:** 2329–48.
7. Feurino LW, *et al*. Current update of cytokines in pancreatic cancer: pathogenic mechanisms, clinical indication, and therapeutic values. *Cancer Invest* 2006; **24:** 696–703.

Damiana

Turnera.

Profile

Damiana is the dried leaves and stem of *Turnera diffusa* var. *aphrodisiaca* (Turneraceae) and possibly other species of *Turnera*. Damiana is drunk as a tea, and is used in herbal medicine for a variety of indications. It has a reputation as an aphrodisiac, but there is no evidence for this.

Homoeopathy. Damiana has been used in homoeopathic medicines under the following names: Turnera diffusa.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Austral.:*** Bioglan Mens Super Soy/Clover; Bioglan The Blue One; Medinat Esten†; Nevaton; ***Canad.:*** Damiana-Sarsaparilla Formula†; ***Indon.:*** Instink; Maxirex; Menolia; Neo Hormoviton; Tripote; Tristan; ***Ital.:*** Dam; Four-Ton; ***Malaysia:*** Total Man†; ***Pol.:*** Tripoten; ***Spain:*** Energysor†; ***UK:*** Daily Fatigue Relief; Damiana and Kola Tablets; Elixir Damiana and Saw Palmetto; Regina Royal Concorde; Strength; Zotrim.

Dapiprazole Hydrochloride *(USAN, rINNM)*

AF-2139; Dapiprazole, Chlorhydrate de; Dapiprazoli Hydrochloridum; Hidrocloruro de dapiprazol. 5,6,7,8-Tetrahydro-3-[2-(4-*o*-tolyl-1-piperazinyl)ethyl]-*s*-triazolo[4,3-*a*]pyridine monohydrochloride.

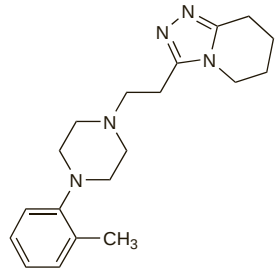
Дапипразола Гидрохлорид

$C_{19}H_{27}N_5$,HCl = 361.9.

CAS — 72822-12-9 (dapiprazole); 72822-13-0 (dapiprazole hydrochloride).

ATC — S01EX02.

ATC Vet — QS01EX02.



(dapiprazole)

Profile

Dapiprazole hydrochloride is an alpha blocker given as eye drops to reverse mydriasis; it is also used in some countries in the management of glaucoma.

Preparations

Proprietary Preparations (details are given in Part 3)
Austria: Benglau; ***Gr.:*** Glamidolo; ***Israel:*** Glamidolo†; ***Ital.:*** Glamidolo; ***USA:*** Rev-Eyes.

Dehydrocholic Acid *(BAN, rINN)*

Acide Déhydrocholique; Ácido dehidrocólico; Acidum Dehydrocholicum; Chologon; Dehydrocholsyra; Dehydrokoolihappo; Triketocholanic Acid. 3,7,12-Trioxo-5β-cholan-24-oic acid.

Дегидрохолевая Кислота

$C_{24}H_{34}O_5$ = 402.5.

CAS — 81-23-2 (dehydrocholic acid); 145-41-5 (sodium dehydrocholate).

Pharmacopoeias. In *Chin.*, *It.*, *Jpn*, and *US*.

USP 31 (Dehydrocholic Acid). A white, fluffy, odourless powder. Practically insoluble in water; soluble 1 in 100 of alcohol, 1 in 135 of acetic acid at 15°, 1 in 130 of acetone at 15°, 1 in 35 of chloroform, 1 in 2200 of ether at 15°, 1 in 135 of ethyl acetate at 15°, and 1 in 960 of benzene at 15°; solutions in alcohol and in chloroform are usually slightly turbid; soluble in glacial acetic acid and in solutions of alkali hydroxides and carbonates.

Profile

Dehydrocholic acid is a semisynthetic bile acid (p.2266) that is given for its hydrocholeretic properties, increasing the volume and water content of the bile without appreciably altering the content of bile acids. It has been used to improve biliary drainage and has also been given for the temporary relief of constipation. The usual oral dose is 250 to 500 mg three times daily after meals.

Dehydrocholic acid is contra-indicated in significant cholelithiasis, complete mechanical biliary obstruction, and in severe hepatic impairment.

Preparations

USP 31: Dehydrocholic Acid Tablets.

Proprietary Preparations (details are given in Part 3)
USA: Cholan-HMB; Decholin.

Multi-ingredient: ***Arg.:*** Arnol; Bagohepat; Bibol Leloup; Bil 13; Bil 13 Enzimatico; Bilagol; Carbogasol Digestivo; Digenorflat; Hepadigenor†; Hepatalgina; Lorbihepatic; Novodigt†; Pakinase; Palatrobil; Pankreon Compuesto†; Pankreon Total; Zimerol; ***Braz.:*** B-Vesil; Digeplus; Digestron†; Essen; Filogaster†; Plasil Enzimatico; Sintozima; ***Hong Kong:*** Bilsan; ***Hung.:*** Neo-Bilagit; ***Mex.:*** Bagohepat; Plasil Enzimatico; ***Philipp.:*** Spasmo-Canulase; ***Pol.:*** Rapacholin C; Rapacholin Forte; ***Port.:*** Espasmo Canulase; ***S.Afr.:*** Spasmo-Canulase; ***Spain:*** Nulacin Fermentos; ***Switz.:*** Spasmo-Canulase.

Delmopinol Hydrochloride *(rINNM)*

Delmopinol, Chlorhydrate de; Delmopinoli Hydrochloridum; Hidrocloruro de delmopinol; M-1650. ±-3-(4-Propylheptyl)-4-morpholineethanol hydrochloride.

Дельмопинола Гидрохлорид

$C_{16}H_{33}NO_2$,HCl = 307.9.

CAS — 79874-76-3 (delmopinol); 98092-92-3 (delmopinol hydrochloride).

Profile

Delmopinol prevents the formation of dental plaque by coating the teeth and preventing adhesion of bacteria. It is used as the hydrochloride, as a mouth rinse in the treatment and prevention of gingivitis.

Preparations

Proprietary Preparations (details are given in Part 3)
UK: Decapinol.

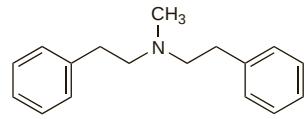
Demelverine Hydrochloride *(rINNM)*

Démelvérine, Chlorhydrate de; Demelverini Hydrochloridum; Hidrocloruro de demelverina; Methphenaethamine Hydrochloride; *N*-Methyldiphenethylamine Hydrochloride. *N*-Methyl-*N*-(2-phenylethyl)-benzeneethanamine hydrochloride.

Демельверина Гидрохлорид

$C_{17}H_{21}N$,HCl = 275.8.

CAS — 13977-33-8 (demelverine); 18719-09-0 (demelverine hydrochloride).



(demelverine)

Profile

Demelverine hydrochloride is an antispasmodic that has been used in the treatment of smooth muscle spasm.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Ger.:*** Spasman†.

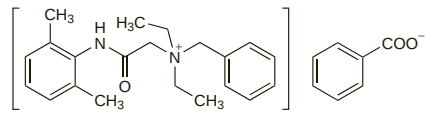
Denatonium Benzoate *(BAN, USAN, rINN)*

Benzoato de denatonio; Denatonii Benzoas; Dénatonium, Benzoate de; NSC-157658. Benzyldiethyl(2,6-xylylcarbamoylmethyl)ammonium benzoate monohydrate.

Денатония Бензоат

$C_{28}H_{34}N_2O_3$,H_2O = 464.6.

CAS — 3734-33-6 (anhydrous denatonium benzoate); 86398-53-0 (denatonium benzoate monohydrate).



Pharmacopoeias. In *USNF*.

USNF 26 (Denatonium Benzoate). When dried at 105° for 2 hours, it contains one molecule of water of hydration or is anhydrous. Soluble 1 in 20 of water, 1 in 2.4 of alcohol, 1 in 2.9 of chloroform, and 1 in 5000 of ether; very soluble in methyl alcohol. pH of a 3% solution in water is between 6.5 and 7.5. Store in airtight containers.

Profile

Denatonium benzoate is used where an intensely bitter taste is required for medicinal or industrial purposes and as a partial denaturant for alcohol in toiletries. It is known commercially as Bitrex.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Fr.:*** Skin Nail.