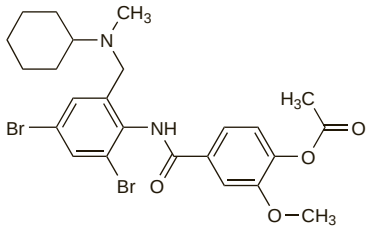
Brovanexine Hydrochloride *(rINNM)*

Brovanexine, Chlorhydrate de; Brovanexini Hydrochloridum; Hidrocloruro de brovanexina. 4-(Acetyloxy)-*N*-[2,4-dibromo-6-[(cyclohexylmethylamino)methyl]phenyl]-3-methoxybenzamide monohydrochloride.

Брованексина Гидрохлорид

$C_{24}H_{29}Br_2ClN_2O_4$ = 604.8.

CAS — 54340-61-3 (brovanexine); 54340-60-2 (brovanexine hydrochloride).



(brovanexine)

Profile

Brovanexine is a derivative of bromhexine (above) and is given orally as the hydrochloride, usually as an adjunct to antibacterials in preparations for the treatment of respiratory-tract infections.

Preparations

Proprietary Preparations (details are given in Part 3)
Braz.: Bronquimucil; ***Port.:*** Bronquimucil†; Pulmo-San†; ***Spain:*** Broncimucil.

Multi-ingredient: ***Arg.:*** Trifamox Bronquial; ***Spain:*** Bronquimucil†; Eupen Bronquial.

Butamirate Citrate *(BANM, USAN, rINNM)*

Abbott-36581; Butamirát-citrát; Butamirate, Citrate de; Butamirati Citras; Butamyrate Citrate; Citrato de butamirato; HH-197. 2-(2-Diethylaminoethoxy)ethyl 2-phenylbutyrate dihydrogen citrate.

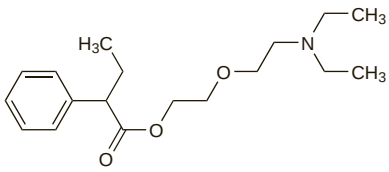
Бутамирата Цитрат

$C_{18}H_{29}NO_3.C_6H_8O_7$ = 499.6.

CAS — 18109-80-3 (butamirate); 18109-81-4 (butamirate citrate).

ATC — R05DB13.

ATC Vet — QR05DB13.



(butamirate)

Profile

Butamirate citrate is a cough suppressant used in non-productive cough (p.1547) and stated to have a central action. The usual oral dose is up to 30 mg daily in 3 or 4 divided doses; some countries permit up to 90 mg daily in divided doses. Modified-release tablets containing 50 mg have been given 2 or 3 times daily.

Preparations

Proprietary Preparations (details are given in Part 3)
Arg.: Dosodos; Talasa NF; Tossec; ***Belg.:*** Quintex†; Sinecod; ***Braz.:*** Besedan†; ***Cz.:*** Sinecod; Tussin; ***Gr.:*** Antis; Antitoss; Betavix; Boutavixal; Bronchofyl; Butacodin; Butagan; Butamir; Butrin; Buvastin; Chemisolv; Chributan; Codexine-R; Codimin; Cyne†; Devix; Doctamine; Drosten; Ellisek-S; Gertotus; Leogumil; Mebronol; Minatuss; Nontoss; Novamir; Oaxen; Pandigal; Pintal; Roctylan; Rondover; Safarol; Sinecod; Siroflex; Stilex; Velkacet; Verocod; Vilvom; Zeleven; Zestapron†; Zetapron; ***Hung.:*** NeoCitran Antitussive; Sinecod; ***Ital.:*** Butiran; Lenistar; Lexosedin; Sinecod Tosse Sedativo; ***Neth.:*** Sinecod; ***Philipp.:*** Sinecod; ***Pol.:*** Sinecod; Supremin; ***Port.:*** Sinecod; ***Rus.:*** Sinecod (Синекод); ***Switz.:*** DemoTussol; NeoCitran Antitussif; Sinecod; ***Thai.:*** Sinecod; ***Turk.:*** Kreval; Sinecod.

Multi-ingredient: ***Arg.:*** Muco Dosodos; ***Braz.:*** Novotussan†; ***Cz.:*** Stoptussin; ***Rus.:*** Stoptussin (Стоптуссин); ***Switz.:*** Hicoseen.

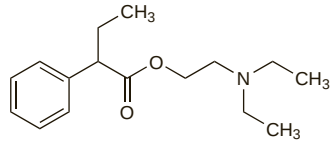
Butetamate Citrate *(BANM, rINNM)*

Butétamate, Citrate de; Butetamati Citras; Butethamate Citrate; Butethamate Dihydrogen Citrate; Citrato de butetamato. 2-Diethylaminoethyl 2-phenylbutyrate citrate.

Бутетамата Цитрат

$C_{16}H_{25}NO_2.C_6H_8O_7$ = 455.5.

CAS — 14007-64-8 (butetamate); 13900-12-4 (butetamate citrate).



(butetamate)

Profile

Butetamate citrate is reported to be an antispasmodic and bronchodilator and has been used alone or in combination preparations for the symptomatic treatment of coughs and other associated respiratory-tract disorders.

Preparations

Proprietary Preparations (details are given in Part 3)
Arg.: Heliphenicol.

Multi-ingredient: ***Arg.:*** Febrigrip; Fugafebril; Kiper; Mejoral Grip; Muco Cortos†; Mucoprednibron; Piritos; Pulmocler; Refenax Jarabe; Tavinex Antigripal; ***Austria:*** Coldadolin; Influbene; ***Switz.:*** Bronchotussine.

Calcium Iodide

Calcii Iodidum; Calciumjodid; Ioduro de calcio; Kalcio jodidas; Kalsiumjodidi.

Йодид Кальция

CaI_2 = 293.9.

CAS — 10102-68-8.

Pharmacopoeias. *Eur.* (see p.vii) includes the tetrahydrate for homoeopathic preparations.

Ph. Eur. 6.2 (Calcium Iodide Tetrahydrate for Homoeopathic Preparations; Calcii Iodidum Tetrahydricum ad Praeparationes Homoeopathicas). A white or almost white, very hygroscopic, powder. Very soluble to freely soluble in water and in alcohol. Store in airtight containers.

Profile

Calcium iodide has been used orally in expectorant mixtures. The limitations of iodides as expectorants are discussed under Cough, p.1547. The actions of the iodides are discussed under Iodine (p.2169).

Homoeopathy. Calcium iodide has been used in homoeopathic medicines under the following names: Calcium iodatum; Calcium jodatum; Calcarea iodata; Cal. iod.

Preparations

Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Arg.:*** Zantril†; ***Gr.:*** Vitreolent; ***USA:*** Calcidrine; Norisodrine with Calcium Iodide.

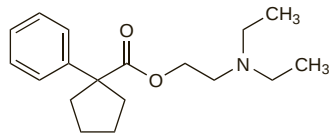
Caramiphen Edisilate *(BANM, rINNM)*

Caramiphen Edisylate; Caramiphène, Edisilate de; Caramipheni Edisilas; Edisilato de caramifeno. 2-Diethylaminoethyl 1-phenylcyclopentane-1-carboxylate ethane-1,2-disulphonate.

Карамифена Эдизилат

$C_{38}H_{60}N_2O_{10}S_2$ = 769.0.

CAS — 77-22-5 (caramiphen); 125-86-0 (caramiphen edisilate); 125-85-9 (caramiphen hydrochloride).



(caramiphen)

Profile

Caramiphen is a centrally acting cough suppressant that has been used as the edisilate in combination preparations for coughs (p.1547). Caramiphen hydrochloride was originally used similarly to trihexyphenidyl (p.820) for its antimuscarinic actions.

Carbocisteine *(BAN, rINN)*

AHR-3053; Carbocisteína; Carbocistéine; Carbocisteinum; Carbocysteine *(USAN)*; Karbocistein; Karbocisteinas; Karbocisztein; Karbocystein; Karbocysteina; Karbosisteiini; Karbosistein; LJ-206. *S*-Carboxymethyl-L-cysteine.

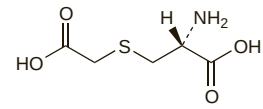
Карбоцистеин

$C_5H_9NO_4S$ = 179.2.

CAS — 2387-59-9; 638-23-3 (carbocisteine, L-form).

ATC — R05CB03.

ATC Vet — QR05CB03.



Pharmacopoeias. In *Chin.*, *Eur.* (see p.vii), and *Jpn*.

Ph. Eur. 6.2 (Carbocisteine). A white or almost white, crystalline powder. Practically insoluble in water and in alcohol; dissolves in dilute mineral acids and in dilute solutions of alkali hydroxides. A 1% suspension in water has a pH of 2.8 to 3.0. Protect from light.

Incompatibility. UK licensed product information states that mixing carbocisteine with pholcodine linctus causes precipitation of carbocisteine from solution but no information is given on whether this incompatibility is with the pholcodine or some component of the formulation used.

Carbocisteine Lysine *(BANM, rINNM)*

Carbocisteína lisina; Carbocistéine Lysine; Carbocisteinum Lysinum; Carbocysteine Lysine.

Карбоцистеина Лизин

CAS — 49673-81-6.

ATC — R05CB03.

ATC Vet — QR05CB03.

Carbocisteine Sodium *(BANM, rINNM)*

Carbocisteína sódica; Carbocistéine Sodique; Carbocysteine Sodium; Natrii Carbocisteinum.

Натрий Карбоцистеин

CAS — 49673-84-9 (carbocisteine sodium, L-form).

ATC — R05CB03.

ATC Vet — QR05CB03.

Adverse Effects and Precautions

Nausea and gastric discomfort, and gastrointestinal bleeding have occasionally occurred with carbocisteine. Skin rashes have also been reported.

Carbocisteine should be used with caution in patients with a history of peptic ulcer disease because of the risk that mucolytics may disrupt the gastric mucosal barrier.

Effects on endocrine function. Transient hypothyroidism associated with the use of carbocisteine developed in a patient with compromised thyroid function.[1]

1. Wiersinga WM. Antithyroid action of carbocisteine. *BMJ* 1986; **293:** 106.

Pharmacokinetics

Carbocisteine is rapidly and well absorbed from the gastrointestinal tract with peak plasma concentrations occurring about 2 hours after an oral dose. It appears to penetrate into lung tissue and respiratory mucus. Carbocisteine is excreted in the urine as unchanged drug and metabolites. Acetylation, decarboxylation, and sulfoxidation have been identified as the major metabolic pathways. Sulfoxidation may be governed by genetic polymorphism.

◊ References.

1. Karim EFIA, *et al.* An investigation of the metabolism of S-carboxymethyl-L-cysteine in man using a novel HPLC-ECD method. *Eur J Drug Metab Pharmacokinet* 1988; **13:** 253–6.
2. Brockmoller J, *et al.* Evaluation of proposed sulphoxidation pathways of carbocysteine in man by HPLC quantification. *Eur J Clin Pharmacol* 1991; **40:** 387–92.
3. Steventon GB. Diurnal variation in the metabolism of S-carboxymethyl-L-cysteine in humans. *Drug Metab Dispos* 1999; **27:** 1092–7.
4. Jovanovic D, *et al.* A comparative bioavailability study of a generic capsule formulation containing carbocysteine. *Pharmazie* 2006; **61:** 446–9.

Uses and Administration

Carbocisteine is used for its mucolytic activity in respiratory disorders associated with productive cough (p.1547). It is given orally in a dose of 750 mg three times daily, reduced by one-third when a response is obtained. Carbocisteine is also given orally as the sodium or lysine salts.

For children's doses, see Administration in Children, below.

Administration in children. Children from 2 to 5 years may be given oral carbocisteine 62.5 to 125 mg four times daily and those aged 5 to 12 years 250 mg three times daily.