Homoeopathy. Aluminium has been used in homoeopathic medicines under the following names: Aluminium metallicum; Al. met.

Preparations

BP 2008: Compound Aluminium Paste.

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Arg.:*** Effidrate†; ***Braz.:*** Belagin; ***Fr.:*** Supro; ***Mex.:*** Dicentril; Gavicid†; Ulgel.

Aluminium Acetate

Aluminio, acetato de; Aluminum Acetate.

$C_6H_9AlO_6$ = 204.1.

CAS — 139-12-8.

Profile

Aluminium acetate is prepared from aluminium sulfate and acetic acid.

Solutions containing aluminium acetate are astringent. Ear drops, which correspond to a solution of aluminium acetotartrate in that they are prepared from aluminium sulfate with the aid of acetic acid and tartaric acid, reduce oedema and inflammation of the ear in conditions such as otitis externa (p.182) by producing an acidic environment hostile to pathogenic bacteria; they are also hygroscopic. Solutions, usually prepared from glacial acetic acid and an aluminum subacetate topical solution (which is itself prepared from aluminium sulfate and acetic acid), have also been used in dermatology as astringent lotions for irritating skin conditions.

Various preparations containing aluminium acetate have been known as Burow's creams, emulsions, lotions, or solutions.

Aluminium acetotartrate and aluminium subacetate (basic aluminium acetate) are also used as topical astringents.

Preparations

BP 2008: Aluminium Acetate Ear Drops;
USP 31: Aluminum Subacetate Topical Solution.

Proprietary Preparations (details are given in Part 3)

Canad.: Buro-Sol; ***Ger.:*** Alsol; Alsol N†; Alsol†; Essigsaure Tonerde-Salbe; Essitol; ***Hung.:*** Alsol; ***Pol.:*** Altacet; Altix; ***Switz.:*** Euceta; ***USA:*** Bite Rx; Buro-Sol†; ***Venez.:*** Acid Mantle.

Multi-ingredient: ***Arg.:*** Aseptalum†; Epiprocto; ***Austral.:*** Xyloproct; ***Austria:*** Acetonal; Euceta mit Kamille; Methyment; Nasanal; ***Braz.:*** Xyloproct; ***Fin.:*** Xyloproct†; ***Fr.:*** Gel a l'Acetotartrate d'Alumine Defresne†; ***Ger.:*** Anisan†; ***Hong Kong:*** Haemoral; ***Indon.:*** Haemocaine; ***Irl.:*** Xyloproct; ***Israel:*** Proctozorin-N; ***Ital.:*** Betaderm; Micofoot; Oleo Calcarea†; Vegetallumina; ***Malaysia:*** Xyloproct; ***Mex.:*** Dermanol; Litiset; Xyloproct Plus; ***Norw.:*** Xyloproct; ***NZ:*** Xyloproct; ***Pol.:*** Kamagel; ***Port.:*** Proctonostrum†; ***Spain:*** Avril; ***Swed.:*** Xyloproct; ***Switz.:*** Anginesin†; Euceta avec camomille et arnica; Euceta Pic; Fortacet; Frigoplasma†; Fungex; Leucen; Mikutan N; Realderm; Topaceta; ***Turk.:*** Hemoralgine; ***UK:*** Xyloproct; ***USA:*** Borofair Otic; Burow's; Otic Domeboro; Star-Otic.

Aluminium Lactate

Aluminio, lactato de. Tris(lactato)aluminium.

$C_9H_{15}AlO_9$ = 294.2.

CAS — 537-02-0; 18917-91-4.

Profile

Aluminium lactate is used in the local treatment of various disorders of the mouth.

Preparations

Proprietary Preparations (details are given in Part 3)
Fr.: Etiaxil; ***Ital.:*** Aluctyl.

Multi-ingredient: ***Israel:*** Aronal Forte; ***Ital.:*** Lacalut; ***Port.:*** Gartun; ***Switz.:*** Deaftol avec lidocaine.

Aluminium Sulfate

Aliuminio sulfatas; Alumiinisulfaatti; Aluminii sulfas; Aluminii Sulfas Hydricus; Aluminio, sulfato de; Aluminium, sulfate d'; Aluminium Sulfuricum; Aluminium Sulphate; Aluminium Trisulphate; Aluminiumsulfat; Alumínium-szulfát; Aluminum Sulfate; E520; Glinu siarczan; Síran hlinitý hydrát.

$Al_2(SO_4)_3.xH_2O$ = 342.2 (anhydrous).

CAS — 10043-01-3 (anhydrous aluminium sulfate); 17927-65-0 (aluminium sulfate hydrate).

Pharmacopoeias. In *Eur.* (see p.vii), *Int.*, and *US.*

Ph. Eur. 6.2 (Aluminium Sulphate). Colourless lustrous crystals or crystalline masses. It contains 51 to 59% of $Al_2(SO_4)_3$. Soluble in cold water; freely soluble in hot water; practically insoluble in alcohol. Store in airtight containers.

USP 31 (Aluminum Sulfate). Contains 54 to 59% of $Al_2(SO_4)_3$. An odourless, white, crystalline powder, shining plates, or crystalline fragments. Soluble 1 in 1 of water; insoluble in alcohol. The pH of a 5% solution in water is not less than 2.9.

Profile

Aluminium sulfate has an action similar to that of alum (p.2254) but is more astringent. A 20% solution is used for the treatment of envenomation by certain insects and marine organisms. The aluminium may cause precipitation of the proteins contained within the venoms thus reducing local toxicity. Aluminium sulfate is also included in astringent preparations intended to soothe irritating skin conditions.

Aluminium sulfate is also used in the preparation of aluminium acetate solutions.

Adverse effects. Possible adverse effects or toxicity associated with aluminium, or aluminium salts such as aluminium sulfate, in the public water supply are discussed under Aluminium, p.2254.

Preparations

USP 31: Aluminum Subacetate Topical Solution; Aluminum Sulfate and Calcium Acetate for Topical Solution; Aluminum Sulfate and Calcium Acetate Tablets for Topical Solution.

Proprietary Preparations (details are given in Part 3)

Austral.: Stingose; ***Hong Kong:*** Stingose; ***NZ:*** Stingose; ***S.Afr.:*** Stingose†; ***UK:*** Stingose.

Multi-ingredient: ***Arg.:*** Gineseptina†; ***Ger.:*** Tannolil†; ***Hung.:*** Burofix†; ***Mex.:*** Domeboro; ***USA:*** Bluboro†; Boropak†; Domeboro; Ostiderm; Pedi-Boro Soak Paks.

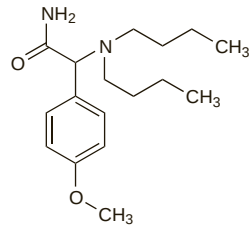
Ambucetamide *(BAN, rINN)*

A-16; Ambucetamida; Ambucétamide; Ambucetamidum; Dibutamide. 2-Dibutylamino-2-(4-methoxyphenyl)acetamide.

Амбуцетамид

$C_{17}H_{28}N_2O_2$ = 292.4.

CAS — 519-88-0.



Profile

Ambucetamide is an antispasmodic and has been given for the relief of dysmenorrhoea. The hydrochloride has also been used.

Preparations

Proprietary Preparations (details are given in Part 3)

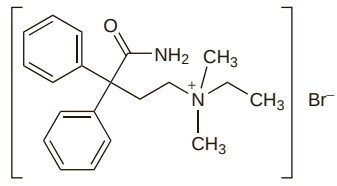
Multi-ingredient: ***Neth.:*** Femerital.

Ambutonium Bromide *(BAN)*

Ambutonii Bromidum; Ambutoniumbromid; Ambutoniumbromidi; BL-700B; R-100. (3-Carbamoyl-3,3-diphenylpropyl)ethyldimethylammonium bromide.

$C_{20}H_{27}BrN_2O$ = 391.3.

CAS — 14007-49-9 (ambutonium); 115-51-5 (ambutonium bromide).



Profile

Ambutonium bromide is a quaternary ammonium antimuscarinic that has been used in gastrointestinal disorders with smooth muscle spasm.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Port.:*** Sediotон†.

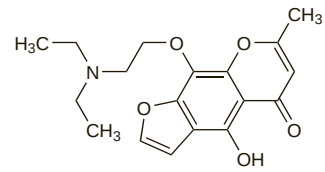
Amikhelline Hydrochloride *(rINNM)*

Amikhelline, Chlorhydrate d'; Amikhellini Hydrochloridum; Hidrocloruro de amikelina. 9-(2-Diethylaminoethoxy)-4-hydroxy-7-methyl-5*H*-furo[3,2-*g*][1]benzopyran-5-one hydrochloride.

Амикеллина Гидрохлорид

$C_{18}H_{21}NO_5$,HCl = 367.8.

CAS — 4439-67-2 (amikhelline); 40709-23-7 (amikhelline hydrochloride).



(amikhelline)

Profile

Amikhelline hydrochloride has been used as an antispasmodic.

Amilomer *(rINN)*

Amilomère; Amilómero; Amilomerum.

Амиломер

CAS — 42615-49-6.

Profile

Amilomer consists of microspheres produced by reaction of partially hydrolysed starch with epichlorohydrin, quickly degradable by amylase (with a half-life of less than 120 minutes); the name is followed by a hyphenated numerical code in which the number preceding the hyphen indicates the half-life in minutes and that following the hyphen indicates the mean diameter of the microspheres in μm.

Amilomer is used in transarterial chemoembolisation procedures in the management of hepatic malignancies.

Preparations

Proprietary Preparations (details are given in Part 3)
Ger.: Spherex.

Aminohippuric Acid

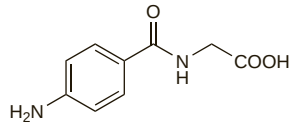
Acidum Aminohippuricum; *p*-Aminobenzoylglycine; *p*-Aminohippuric Acid; Aminohippurihappo; Aminohippursyra; Aminohipúrico, ácido; Kwas aminohipurowy; PAHA; Para-aminohippuric Acid. *N*-4-Aminobenzoylaminoacetic acid.

$C_9H_{10}N_2O_3$ = 194.2.

CAS — 61-78-9 (aminohippuric acid); 94-16-6 (sodium aminohippurate).

ATC — V04CH30.

ATC Vet — QV04CH30.



Pharmacopoeias. In *US.*

USP 31 (Aminohippuric Acid). A white crystalline powder which discolours on exposure to light. Soluble 1 in 45 of water, 1 in 50 of alcohol, and 1 in 5 of 3N hydrochloric acid; very slightly soluble in carbon tetrachloride, in chloroform, in ether, and in benzene; freely soluble in alkaline solutions with some decomposition, and in diluted hydrochloric acid. Store in airtight containers. Protect from light.

Adverse Effects

Sodium aminohippurate may cause nausea and vomiting, hypersensitivity reactions, vasomotor disturbances, flushing, tingling, cramps, and a feeling of warmth. Patients may develop an urge to urinate or defaecate after infusion.

Interactions

The estimation of sodium aminohippurate may be affected in patients taking procaine, sulfonamides, or thiazosulfone. Probenecid diminishes the excretion of aminohippuric acid. Clearance is also affected by penicillins, salicylates, and other drugs that compete for the same excretory pathways.

Uses and Administration

Aminohippuric acid is excreted mainly by proximal tubular secretion, with some glomerular filtration. It is given by intravenous infusion, as sodium aminohippurate (aminohippurate sodium; $C_9H_9N_2NaO_3$ = 216.2), for the estimation of effective renal plasma flow. Doses are aimed at producing a plasma concentration of 20 micrograms/mL; at these concentrations about 90% of aminohippurate is cleared from the renal bloodstream in a single circuit in patients with normal renal function. Sodium aminohippurate has also been used for the assessment of the renal tubular secretory mechanism. Doses for this purpose are infused slowly to achieve a plasma concentration of 400 to 600 micrograms/mL to saturate the tubular secretion. These tests are used mainly in research procedures.

Preparations

USP 31: Aminohippurate Sodium Injection.

Ammi Visnaga Fruit

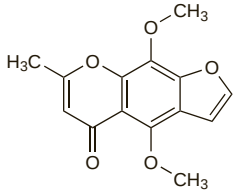
Biznaga, fruto de la; Khella; Khellah; Picktooth Fruit; Visnaga.

Khellin *(rINN)*

Kelina; Khelline; Khellinum; Visammin. 4,9-Dimethoxy-7-methyl-5*H*-furo[3,2-*g*]chromen-5-one.

Келлин

$C_{14}H_{12}O_5$ = 260.2.
CAS — 82-02-0.

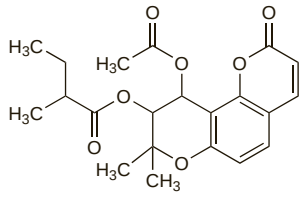


Visnadine *(BAN, rINN)*

Visnadina; Visnadinum. 10-Acetoxy-9,10-dihydro-8,8-dimethyl-2-oxo-2*H*,8*H*-pyrano[2,3-*f*]chromen-9-yl 2-methylbutyrate.

Виснадин

$C_{21}H_{24}O_7$ = 388.4.
CAS — 477-32-7.
ATC — C04AX24.
ATC Vet — QC04AX24.



Profile

Ammi visnaga fruit is used in herbal preparations.

Khellin and visnadine are vasodilators obtained from *Ammi visnaga* fruit or by synthesis. Khellin also has a bronchodilatory action and has been used in angina pectoris and asthma. Khellin has also been tried in conjunction with UV light to treat vitiligo (see Pigmentation Disorders, p.1582). Visnadine has been used in coronary, cerebral, and peripheral vascular disorders.

Homoeopathy. Ammi visnaga has been used in homoeopathic medicines under the following names: Ammi vis.

◊ References.

1. Hofer A, *et al.* Long-term results in the treatment of vitiligo with oral khellin plus UVA. *Eur J Dermatol* 2001 **11:** 225–9.

Preparations

Proprietary Preparations (details are given in Part 3)
Ger.: Khellangan N†.

Multi-ingredient: ***Austria:*** Urelium Neu; ***Ger.:*** Cefadrin; Oxacant-Khella N†; Stenocrat†; ***Pol.:*** Kelicardina; Nefrol.

Ammonia

Amoníaco, solución diluida de; Amonowy wodorotlenek; Amonyak.

CAS — 7664-41-7.

NH_3

NOTE. The food additive number E527 is used for ammonium hydroxide. Solutions of ammonia in water have been referred to as ammonium hydroxide solutions. Strong solutions of ammonia have also been described by the synonyms Ammoniaca, Ammoniacum, Ammoniaque Officinale, and Liquor Ammoniae Fortis. Dilute solutions of ammonia have also been referred to as Ammonia Water, Ammonium Hydricum Solutum, Liquor Ammoniae, and Liquor Ammoniae Dilutus.

Pharmacopoeias. Strong ammonia solutions are included in *Chin.* (25 to 28%), *Eur.* (see p.vii) (25 to 30%), and *USNF* (27 to 31%). Dilute ammonia solutions are included in *Br., Chin., Ger., Jpn,* and *Swiss* (all about 10%).

Ph. Eur. 6.2 (Ammonia Solution, Concentrated; Ammoniae Solutio Concentrata; Strong Ammonia Solution BP 2008). It contains between 25% and 30% (w/w) of ammonia, NH_3. A clear colourless liquid. Very caustic. Miscible with water and with alcohol. Store at a temperature not exceeding 20° in airtight containers.

BP 2008 (Dilute Ammonia Solution). It is prepared by diluting Strong Ammonia Solution with freshly boiled and cooled purified water. It contains 9.5 to 10.5% w/w of NH_3.

NOTE. The BP directs that when Ammonia Solution is prescribed or demanded, Dilute Ammonia Solution shall be dispensed or supplied.

USNF 26 (Strong Ammonia Solution). It contains between 27% and 31% (w/w) of NH_3. On exposure to air, it loses ammonia rapidly. A clear colourless liquid with an exceedingly pungent characteristic odour. Store at a temperature not exceeding 25° in airtight containers.

Handling. Strong ammonia solutions should be handled with great care because of the caustic nature of the solutions and the irritating properties of the vapour. Cool the container well before opening and avoid inhalation of the vapour.

Adverse Effects

Ingestion of strong solutions of ammonia causes severe pain in the mouth, throat, and gastrointestinal tract, as well as severe local oedema and salivation, with cough, vomiting, and shock. Burns to the oesophagus and stomach may result in perforation. Stricture formation, usually in the oesophagus, can occur weeks or months later. Ingestion may also cause oedema of the respiratory tract and pneumonitis, though this may not develop for a few hours.

Inhalation of ammonia vapour causes sneezing and coughing and in high concentration causes pulmonary oedema. Asphyxia has been reported after oedema or spasm of the glottis. Ammonia vapour is irritant to the eyes and causes weeping; there may be conjunctival swelling and temporary blindness.

Ammonia solution in contact with skin and eyes produces blistering and vesiculation; ammonia burns feel 'soapy' because of saponification of the tissues. Strong solutions on the conjunctiva cause a severe reaction with conjunctival oedema, corneal damage, and acute glaucoma. Late complications include angle-closure glaucoma, opaque corneal scars, atrophy of the iris, and formation of cataracts. Ammonia burns have resulted from treating insect bites and stings with the strong solution, and even with the dilute solution, especially if a dressing is subsequently applied.

◊ References.

1. Beare JDL, *et al.* Ammonia burns of the eye: an old weapon in new hands. *BMJ* 1988; **296:** 590.
2. WHO. Ammonia health and safety guide. *IPCS Health and Safety Guide 37*. Geneva: WHO, 1990. Available at: http://www.inchem.org/documents/hsg/hsg/hsg037.htm (accessed 04/04/06)
3. Payne MP, Delic JI. Ammonia. In: *Toxicity Review 24*. London: HMSO, 1991: 1–12.
4. Payne MP, *et al. Toxicology of substances in relation to major hazards: ammonia*. London: HMSO, 1991.
5. Leduc D, *et al.* Acute and long term respiratory damage following inhalation of ammonia. *Thorax* 1992; **47:** 755–7.
6. Michaels RA. Emergency planning and the acute toxic potency of inhaled ammonia. *Environ Health Perspect* 1999; **107:** 617–27.
7. Amshel CE, *et al.* Anhydrous ammonia burns case report and review of the literature. *Burns* 2000; **26:** 493–7.
8. Kerstein MD, *et al.* Acute management of exposure to liquid ammonia. *Mil Med* 2001; **166:** 913–14.

Toxicity from mixing cleaning agents. For reference to the adverse effects of mixing ammonia-based and hypochlorite-based cleaning agents see Sodium Hypochlorite, p.1661.

Treatment of Adverse Effects

Ingestion of ammonia solutions should not be treated by lavage or emesis. Milk or water have been given as diluents, but small volumes should be used to reduce the risk of inducing emesis. Appropriate measures should be taken to alleviate pain, shock, and pulmonary oedema, and maintain an airway.

Contaminated skin and eyes should be flooded immediately with water and the washing continued for at least 15 minutes. Any affected clothing should be removed while flooding is being carried out.

Uses and Administration

Dilute solutions of ammonia have been used as reflex stimulants either as smelling salts or oral solutions. They have also been used as rubefacients and counter-irritants (see p.5) and to neutralise insect stings. Users should always be aware of the irritant properties of ammonia.

Hartshorn and Oil was sometimes used as a name for an ammonia liniment. Household ammonia and cloudy ammonia have been used as names for cleaning preparations of ammonia with oleic acid or soap respectively. A saturated solution containing about 35% w/w and known as '0.880 ammonia' has been used in many chemical and industrial applications.

Stings. Bathers who were stung by Portuguese men-of-war (*Physalia physalis*) were rapidly and effectively relieved of discomfort, paresis, irritation, and other symptoms by the application of aromatic ammonia spirit compresses.[1]

1. Frohman IG. Treatment of physalia stings. *JAMA* 1966; **197:** 733.

Preparations

BP 2008: Aromatic Ammonia Solution; Aromatic Ammonia Spirit; Strong Ammonium Acetate Solution; White Liniment.

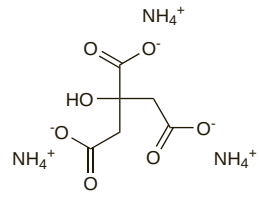
Proprietary Preparations (details are given in Part 3)
Canad.: After Bite; ***Israel:*** Afterbite; ***Spain:*** After Bite; Calmapica; ***Switz.:*** After Bite; ***UK:*** After Bite.

Multi-ingredient: ***Austral.:*** Senega and Ammonia; ***Austria:*** Rowalind; ***Canad.:*** Bronchex†; SJ Liniment; ***Chile:*** Rhus Opodeldoc; ***Cz.:*** Pain Expeller†; ***Hung.:*** Opodeldok†; ***Ital.:*** Baby Zanzara; Stilomagic†; ***S.Afr.:*** Enterodyne; ***Spain:*** Masagil; ***UK:*** Blistex Relief Cream; Goddards Embrocation; Mackenzies Smelling Salts; Pickles Smelling Salts; ***USA:*** Emergent-Ez.

Ammonium Citrate

Ammon. Cit.; Amonowy cytrynian; E380; Triammonium Citrate.

$C_6H_5O_7(NH_4)_3$ = 243.2.
CAS — 3458-72-8.



Profile

Ammonium citrate is used as a food additive and has been used in respiratory-tract disorders.

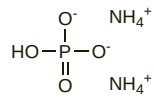
Preparations

Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Chile:*** Ambrotos; Mucobrol.

Ammonium Phosphate ⊗

545 (ammonium polyphosphates); Amonowy wodorofosforan; Diammonium Hydrogen Phosphate; Dibasic Ammonium Phosphate; Fosfato de amonio. Diammonium hydrogen orthophosphate.

$(NH_4)_2HPO_4$ = 132.1.
CAS — 7783-28-0.



Pharmacopoeias. In *USNF.*

USNF 26 (Ammonium Phosphate). Colourless or white granules or powder. Freely soluble in water; practically insoluble in alcohol and in acetone. A 1% solution in water has a pH of 7.6 to 8.2. Store in airtight containers.

Profile

Ammonium phosphate was formerly used as a diuretic. It may be used as a buffering agent in pharmaceutical preparations.

Ammonium biphosphate (monobasic ammonium phosphate; $NH_4H_2PO_4$ = 115.0) has been used to acidify urine and as a phosphate supplement.

Preparations

Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Fr.:*** Phosphore Medifa; ***Pol.:*** Phosphor.

Amnion

Amnios.

Profile

Human extra-embryonic fetal membranes comprise an inner amniotic membrane, the amnion, and an outer membrane, the chorion. Amnion is used in ocular surgery for a range of conditions. Both amnion and combined membranes have been used as a dressing for raw wounds including chronic ulcers and burns.

Amylase

Amilasa; Amylaza; Diastase; Glucogenase; Ptyalin.

CAS — 9000-92-4 (amylase); 9000-85-5 (bacterial α-amylase); 9000-90-2 (porcine α-amylase, pancreatic); 9001-19-8 (taka-diastase);.
ATC — A09AA01.
ATC Vet — QA09AA01.

Pharmacopoeias. In *Fr.* and *Jpn.*

Adverse Effects

Hypersensitivity reactions have been reported.