

Preparations**USP 31:** Aminohippurate Sodium Injection.**Ammi Visnaga Fruit**

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

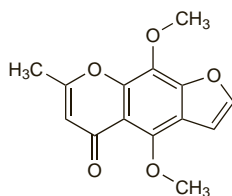
Khellin (rINN)

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

Келлин

C₁₄H₁₂O₅ = 260.2.

CAS — 82-02-0.

**Visnadine** (BAN, rINN)

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

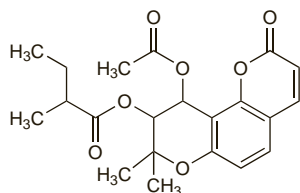
Виснадин

C₂₁H₂₄O₇ = 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 NF.**Multi-ingredient:** **Austria:** Urelium Neu; **Ger.:** Cefadrin; Oxacant-Khella NF; Stenocrat; **Pol.:** Kelicardina; Nefrol.**Ammonia**

Amoniaco, solución diluida de; Amonowy wodorotlenek; Amonyak.

CAS — 7664-41-7.



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 Ammoniacum, Ammoniacum Officinale, and Liquor Ammoniae Fortis. Dilute solutions of ammonia have also been referred to as Ammonia Water, Ammonium Hydricum Solutum, Liquor Ammoniacum, 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 containsbetween 25% and 30% (w/w) of ammonia, NH₃. 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 NH₃.

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 NH₃. 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.

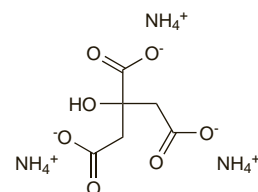
Hartshorn and Oil was sometimes used as a name for an ammonia liniment. Household ammonia and cloudy ammonia have been used as names for cleaning preparations of ammonia with oleic acid or soap respectively. A saturated solution containing about 35% w/w and known as '0.880 ammonia' has been used in many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

Stings. Bathers who were stung by Portuguese men-of-war (*Physalia physalis*) were rapidly and effectively relieved of discomfort, paresthesia, irritation, and other symptoms by the application of aromatic ammonia spirit compresses.¹1. 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.:** Opodeldlok; **Ital.:** Baby Zanzara; Stilmagic; **S.Afr.:** Entero-dyne; **Spain:** Masagi; **UK:** Blistex Relief Cream; Goddards Embrocation; Mackenzies Smelling Salts; Pickles Smelling Salts; **USA:** Emergent-Ez.**Ammonium Citrate**

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

C₆H₅O₇(NH₄)₃ = 243.2.

CAS — 3458-72-8.

**Profile**

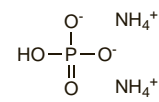
Ammonium citrate is used as a food additive and has been used in respiratory-tract disorders.

Preparations**Proprietary Preparations** (details are given in Part 3)**Multi-ingredient:** **Chile:** Ambratos; Mucobrol.**Ammonium Phosphate** ⊗

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

(NH₄)₂HPO₄ = 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; NH₄H₂PO₄ = 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.