and other neurological disorders, but its use has been associated with bone-marrow suppression in some patients.

♦ References

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#### Guanosine

Guanine Riboside; NSC-19994; Vernine. 2-Amino-9-β-D-ribo-furanosyl-9H-purin-6(1H)-one.

 $C_{10}H_{13}N_5O_5 = 283.2.$  CAS — 118-00-3.

#### **Profile**

Guanosine is an endogenous guanine nucleoside involved in many biological processes; it is one of the components of nucleic acids (p.2355). Guanosine is included in preparations for peripheral and cerebral vascular disorders and myopathies; guanosine monophosphate has been used similarly.

#### **Preparations**

**Proprietary Preparations** (details are given in Part 3) **Multi-ingredient:** *Cz.:* Laevadosin†; *Spain:* Nutracel.

## Gutta Percha

Gummi Plasticum; Gutapercha; Gutt. Perch.

## Pharmacopoeias. In US.

USP 31 (Gutta Percha). The coagulated, dried, purified latex of the trees of the genera *Palaquium* and *Payena* and most commonly *Palaquium gutta* (Sapotaceae). It occurs in lumps or blocks of variable size; externally brown or greyish-brown to greyish-white in colour; internally reddish-yellow or reddish-grey and having a laminated or fibrous appearance. It is flexible but only slightly elastic. Has a slight, characteristic odour. Insoluble in water; partly soluble in carbon disulfide, in turpentine oil, and in benzene; about 90% soluble in chloroform. Store under water. Protect from light.

## **Profile**

Gutta percha has been used in various dressings. In dentistry, gutta percha has been used as a filling material and as the basis of compounds for taking dental impressions.

# Haematoporphyrin

Hematoporfirina.  $C_{34}H_{38}N_4O_6 = 598.7$ . CAS — 14459-29-1.

## Profile

Haematoporphyrin is a red pigment, free from iron, obtained from haematin. It is an ingredient of preparations promoted as tonics, particularly for the elderly, and has been used in the treatment of depression. Derivatives of haematoporphyrin are used as photosensitisers in the photodynamic therapy of malignant neoplasms (see Porfimer Sodium, p.764).

#### **Preparations**

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: Austria: KH3; Chile: Actebral; KH3-Vit†; KH3†; Ger.: KH3†; Revicain comp plus†; Hong Kong: KH3; Ital.: Porfirin 12; Tonogen; Vit-Porphyrin†; NZ: KH3; Thai.: KH3.

#### **Hamamelis**

Amamelide; Csodamogyorólevél (hamamelis leaf); Hamamelidis; Hamamelidis folium (hamamelis leaf); Hamameliksenlehti (hamamelis leaf); Hamamélis de virginie; Hamamélis, feuille d' (hamamelis leaf); Hamamelisblad (hamamelis leaf); Hamameliju lapai (hamamelis leaf); Trollhassel; Vilínový list (hamamelis leaf); Virginsk Troldnød; Witch Hazel; Zauberhasel; Zaubernuss.

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

**Ph. Eur. 6.2** (Hamamelis Leaf). The whole or cut dried leaves of *Hamamelis virginiana* containing not less than 3% tannins, expressed as pyrogallol  $(C_6H_6O_3=126.1)$ , calculated with reference to the dried drug. Protect from light.

**USP 31** (Witch Hazel). A clear, colourless distillate prepared from recently cut and partially dried dormant twigs of *Hamamelis virginiana*. pH between 3.0 and 5.0. Store in airtight containers at a temperature not exceeding  $40^\circ$ .

## **Profile**

Hamamelis has astringent properties and contains gallic acid, a bitter principle, and a trace of volatile oil. It is used in preparations for the symptomatic relief of haemorrhoids (p.1697). Hamamelis water is used as a cooling application and has been applied as a haemostatic.

Hamamelis is used in herbal preparations for a variety of disor-

Homoeopathy. Hamamelis has been used in homoeopathic medicines under the following names: Hamamelis virginiana; Hamamelis, Folium; Hamamelis virginiana e foliis; Hamamelis virginiana ex cortice summitatibusque; Hamamelis virginica; Ham. virg.

## **Preparations**

USP 31: Witch Hazel.

**Proprietary Preparations** (details are given in Part 3)

Austral.: Optrex Original; Witch Doctor†; Austria: Hametum; Sperti Praparation H†; Canad.: Optrex; Chile: Similia†; Sperti Preparacion H Clear Gel†; Fr.: Optrex; Ger.: Aescorin N†; Hamelis†; Haemo Duoform†; Hamasana†; Hametum; Posterine; Tampositorien H†; Venoplant top†; Ital.: Acqua Virginiana; Derminiol; Optrex; Malaysia: Optrex; Mex.: Tia Puppy; NZ: Optrex; Dic.: Phloderm; Port.: Optrex; Singapore: Optrex; Smilo; Derminiol; Hametol; Hemo Derminiol; Optrex; Switz.: Mavena Anal-Gen; Optrex; Thal.: Optrex; Turk.: Hametan; UK: Optrex; Preparation H Clear Gel; Witch Doctor; Witch Sunsore; USA: A-E-R; Fleet Medicated Pads†; Neutrogena Drying.

Multi-ingredient: Arg.: Banofial†, Clematis III Oligoplex†, Domuderm; Ecnagel; Esculeol P; Lavandula Oligoplex, Manzan; Venoful; VNS 45; Austral.: Anusoi; Bioglan Cirilo†, Gentlees; Hemocane; Optrex; Proflo†, Austral.: Anusoi; Bioglan Cirilo†, Gentlees; Hemocane; Optrex; Proflo†, Austral.: Anusoi; Bioglan Cirilo†, Fig. 199; Tampositorien mit Belladonna; Belg.: Hemorhinol; Purigel Crisp; Rectovasoi; Braz.: Bromidrastina†; Hemodotit; Hemorroidex†, Higicler; Makartrion Natural Organic Manolio†, Mirorroidin†; Proctosan; Supositorio Hamamelis Composto†; Varizol†, Visionom; Canad.: Onrectal; Penaten; Preparation H Cooling Gel; Tucks; Chile: Hemorroidex†, Keracryl stop bouton; Medillor Tisane Circulation du Sang No 12: Ophtalmine; Pastilles Monleon; Medillor Tisane Circulation du Sang No 12: Ophtalmine; Pastilles Monleon; Medillor Tisane Circulation du Sang No 12: Ophtalmine; Pastilles Monleon; Medillor Tisane Circulation du Sang No 12: Ophtalmine; Pastilles Monleon; Medillor Tisane Circulation du Sang No 12: Ophtalmine; Pastilles Monleon; Medillor Tisane Circulation du Sang No 12: Ophtalmine; Pastilles Monleon; Medillor Tisane Circulation du Sang No 12: Ophtalmine; Pastilles Monleon; Medillor Tisane Circulation du Sang No 12: Ophtalmine; Pastilles Monleon; Medillor Tisane Circulation du Sang No 12: Ophtalmine; Pastilles Monleon; Dellore Sand; Philosopethy Philosopethy Philosopethy Pintonion; Purison; Eva Chenter Monleon; Purison; Purison

#### Harmaline

Harmalina. 3,4-Dihydroharmine.  $C_{13}H_{14}N_2O = 214.3$ . CAS — 304-21-2.

**Description.** Harmaline is an alkaloid obtained from peganum, the dried seeds of *Peganum harmala* (Zygophyllaceae)

the dried seeds of *Peganum harmala* (Zygophyllaceae). The following terms have been used as 'street names' (see p.vi) or slang names for various forms of harmaline or preparations containing harmaline:

Caapi; Huasca; Purga, la; Vine; Yage.

— 442-51-3.

#### Harmine

**Description.** Harmine is an alkaloid obtained from peganum, the dried seeds of *Peganum harmala* (Zygophyllaceae), also known as syrian rue.

Harmine is identical with an alkaloid known as banisterine or telepathine obtained from *Banisteriopsis caapi* (Malpighiaceae). The following terms have been used as 'street names' (see p.vi) or slang names for various forms of harmine or preparations containing harmine:

#### **Profile**

Harmine and harmaline are the main active principles of a hallucinogenic drink, known in South American regions as 'ayahuas-ca', 'caapi', or 'yage', that is made from closely related plants of the family Malpighiaceae. They have no therapeutic use.

## **Helonias**

Blazing Star; Chamaelirium; False Unicorn; Starwort.

## **Profile**

Helonias is the root of *Chamaelirium luteum (Helonias dioica)* (Liliaceae). It is used in herbal medicine particularly for gynaecological disorders.

**Homoeopathy.** Helonias has been used in homoeopathic medicines under the following names: Chamaelirium luteum; Helonias dioica; Helon.

## **Preparations**

**Proprietary Preparations** (details are given in Part 3)

Multi-ingredient: Austral.: Capsella Complex; Nervatona Calm; Nervatona Focus; UK: Period Pain Relief.

## Henna

Henna Leaf; Henné; Lawsonia.

## Profile

Henna is the dried leaves of *Lawsonia inermis* (*L. alba*) (Lythraceae), containing lawsone (p.2331). Powdered henna is used for dyeing the hair, skin, and nails.

Adverse effects. Allergic skin reactions to henna used to dye the skin have been reported. Such reactions were usually due to additives used to shorten the application time of the dye and allergic reactions to 'plain' henna were rare. Similar reactions have been reported<sup>2-10</sup> after henna tattoos on the skin. The adulterant, which is added to natural henna to darken it ('black henna'), was identified<sup>2-5</sup> as paraphenylenediamine (p.2363). There have been reports of the paraphenylenediamine adulterant producing permanent skin pigment changes<sup>7,10</sup> and also cross-sensitisation to paraphenylenediamine-containing hair dyes<sup>7-10</sup> and textile dyes; there is also the possibility of sensitisation to other allergens such as natural rubber latex. O

The suggestion that henna may cause neonatal hyperbilirubinaemia is discussed under Lawsone, p.2331.

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## Heptaminol Hydrochloride (BANM, rINNM) ⊗

Heptaminol, Chlorhydrate d'; Heptaminol, chlorhydrate de; Heptaminol hydrochlorid; Heptaminol-hidroklorid; Heptaminolhydroklorid; Heptaminoli hydrochloridum; Heptaminolihydrokloridi; Heptaminolio hidrochloridas; Hidrocloruro de heptaminol; RP-2831. 6-Amino-2-methylheptan-2-ol hydrochloride.

Гептаминола Гидрохлорид

 $C_8H_{19}NO,HCI = 181.7.$ 

CAS — 372-66-7 (heptaminol); 543-15-7 (heptaminol hydrochloride).

ATC - COIDX08. ATC Vet — QC01DX08.

Pharmacopoeias. In Eur. (see p.vii).

Ph. Eur. 6.2 (Heptaminol Hydrochloride). A white or almost white crystalline powder. Freely soluble in water; soluble in alcohol; practically insoluble in dichloromethane.

#### **Profile**

Heptaminol hydrochloride is a cardiac stimulant and vasodilator and has been given in the treatment of cardiovascular disorders. Heptaminol and heptaminol adenosine phosphate have also been used.

## **Preparations**

Proprietary Preparations (details are given in Part 3)

Fr.: Ampecyclal; Hept-A-Myl; Indon.: Hept-a-myl; Ital.: Coreptil†.

Multi-ingredient: Arg.: Flebitol; Cz.: Ginkor Fort; Fr.: Debrumyl; Ginkor Fort; Ger.: Normotin-R†; Perivar†; Veno-Tebonin N†; Hong Kong: Ginkor Fort; Hung.: Ginkor Fort Ginkor Fort; Port.: Debrumyl; Forticol; Rus.: Ginkor Fort (Γινικορ Φορτ); Spain: Denubli; Largatrex†; Thai.: Ginkor Fort.

## Herniaria

Bruchkraut; Herba Herniariae; Herniary; Rupturewort; Rupturewort.

## **Profile**

Herniaria consists of the dried leaves and flowering tops of various species of rupture-wort, chiefly Herniaria glabra and H. hirsuta (Caryophyllaceae). It has astringent and diuretic properties and has been given in urinary-tract disorders.

**Homoeopathy.** Herniaria has been used in homoeopathic medicines under the following names: Herniaria glabra; Hern. gla.

## **Preparations**

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: Austria: Blasentee St Severin; Uropurat; Cz.: Urolog-

## Hexylene Glycol

Hexilenglicol. 2-Methyl-2,4-pentanediol.  $C_6H_{14}O_2 = 118.2.$ CAS - 107-41-5.

Pharmacopoeias. In USNF.

USNF 26 (Hexylene Glycol). A clear, colourless, viscous liquid. Absorbs moisture when exposed to moist air. Miscible with water and with many organic solvents including alcohol, acetone, chloroform, ether, and hexanes. Store in airtight containers.

Hexylene glycol has properties similar to those of propylene glycol (p.2374). It is used as a pharmaceutical aid.

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: USA: Bodi Kleen.

#### Hibiscus

Guinea Sorrel; Hibisci Flos (flowers); Hibisci Sabdariffae Flos (flowers); Hibiscusblüten (flowers); Jamaica Sorrel; Jamaikinių hibiskų žiedai (flowers); Karkadé; Květ ibišku sudánského (flowers); Oseille de Guinée; Red Sorrel; Rosella; Rosellenkukka (flowers); Rosellhibiskusblomma (flowers): Rozella (flowers).

Гибискус Сабдарифа; Кислица Ямайская

Pharmacopoeias. In Eur. (see p.vii).

Ph. Eur. 6.2 (Roselle; Hibisci Sabdariffae Flos). The whole or cut dried calyces and epicalyces of Hibiscus sabdariffa collected

#### **Profile**

Hibiscus is a large genus of flowering plants in the Malvaceae family. The flowers of roselle, Hibiscus sabdariffa, are included in herbal preparations for loss of appetite and a range of disorders of the upper respiratory and gastrointestinal tracts

Culinary uses of H. sabdariffa include hibiscus tea, a refreshing caffeine-free beverage made from the flowers.

Homoeopathy. Hibiscus sabdariffa has been used in homoeopathic medicines under the following names: Sabdariffa.

#### **Preparations**

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: Fr.: Calmophytum: Hydracur.

#### Histamine

Histamiini; Histamin; Histamina; Histaminum. 2-(Imidazol-4yl)ethylamine.

 $C_5H_9N_3 = 111.1.$ 

CAS \_ 51-45-6.

ATC - V04CG03.

ATC Vet — QV04CG03.

## Histamine Hydrochloride

Histamiinidihydrokloridi; Histamina, hidrocloruro de; Histamindihydrochlorid; Histamindihydroklorid; Histamine, dichlorhydrate d'; Histamine Dihydrochloride (USAN); Histamini dihydrochloridum; Histamino dihidrochloridas; Histaminy dichlorowodorek; Hisztamin-dihidroklorid.

 $C_5H_9N_3,2HCI = 184.1.$ 

CAS — 56-92-8. ATC — L03AX14; V04CG03.

ATC Vet - QL03AX14; QV04CG03.

Pharmacopoeias. In Eur. (see p.vii).

Ph. Eur. 6.2 (Histamine Dihydrochloride). Hygroscopic, colourless crystals or white or almost white crystalline powder. Very soluble in water; soluble in alcohol. A 5% solution in water has a pH of 2.85 to 3.60. Protect from light.

# Histamine Phosphate

Histamiinifosfaatti; Histamin difosfát monohydrát; Histamina, fosfato de; Histamine Acid Phosphate; Histamine Diphosphate; Histamine, phosphate d'; Histaminfosfat; Histamini Diphosphas Monohydricus; Histamini phosphas; Histamino fosfatas; Histaminy fosforan; Hisztamin-foszfát.

 $C_5H_9N_3,2H_3PO_4,H_2O = 325.2.$ 

CAS — 51-74-1 (anhydrous histamine phosphate).

ATC — V04CG03.

ATC Vet - QV04CG03

Pharmacopoeias. In Eur. (see p.vii). Chin. and US specify the anhydrous substance.

Ph. Eur. 6.2 (Histamine Phosphate). Colourless, long prismatic crystals. Freely soluble in water, slightly soluble in alcohol. A 5% solution in water has a pH of 3.75 to 3.95. Protect from light. USP 31 (Histamine Phosphate). Anhydrous histamine phosphate occurs as colourless, odourless, long prismatic crystals. Is stable in air but is affected by light. Soluble 1 in 4 of water. Its solutions are acid to litmus. Store in airtight containers. Protect

Stability. A study concluded that solutions of histamine phosphate could be sterilised by heating in an autoclave with little degradation.1 Autoclaved solutions could be stored for a minimum of 4 months.

1. McDonald C, et al. Stability of solutions of histamine acid phosphate after sterilization by heating in an autoclave. *J Clin Pharm Ther* 1990; **15**: 41–4.

#### **Adverse Effects and Treatment**

Injection of histamine salts can produce adverse effects including headache, flushing of the skin, general vasodilatation with a fall in blood pressure, tachycardia, bronchial constriction and dyspnoea, visual disturbances, vomiting, diarrhoea, and other gastrointestinal effects. These reactions can be severe; excessive dosage can produce collapse and shock, and may be fatal. Reactions may occur at the injection site.

Some of these effects may be relieved by an antihistamine, but adrenaline may be required and should always be available.

Histamine salts should be used with care in patients with asthma or other hypersensitivity disorders, in elderly patients, and in patients with cardiovascular disorders.

#### **Pharmacokinetics**

Histamine salts exert a rapid, though transient, effect when given parenterally. Histamine is rapidly metabolised by methylation and oxidation; the metabolites are excreted in the urine.

♦ References.

1. Middleton M. et al. Pharmacokinetics of histamine dihydrochloride in healthy volunteers and cancer patients: implications for combined immunotherapy with interleukin-2. J Clin Pharmacol 2002: 42: 774-81.

#### Uses and Administration

Histamine causes stimulation of smooth muscle, especially of the bronchioles, and lowers blood pressure by dilating the arterioles and capillaries. It also stimulates exocrine gland secretion, especially the gastric glands.

Intradermal injection of histamine produces the characteristic 'triple response' of erythema, flare, and wheal. This is utilised as a control response in skin testing for hypersensitivity. Also, since it is mediated in part by axon reflexes, it has been used to test the integrity of sensory nerves, for example in leprosy.

Inhalation of histamine causes bronchoconstriction and is used as a test of bronchial reactivity.

Histamine has also been given subcutaneously to identify the causes of achlorhydria and intravenously in the diagnosis of phaeochromocytoma, but safer tests are generally preferred.

Histamine is included in some combination topical preparations for musculoskeletal disorders.

Histamine hydrochloride is under investigation as an adjunct in the management of acute myeloid leukaemia and malignant melanoma. It has also been tried as an adjunct to interferons and other drugs in the management of hepatitis C.

## **Preparations**

USP 31: Histamine Phosphate Injection.

Proprietary Preparations (details are given in Part 3)

Mex.: Destamin; Port.: Soluprick; Venez.: Histalgan Balsamo†. Multi-ingredient: Arg.: Histaglobin; Infrarub; Austria: Histaglobin; Cenad.: Midalgan; Cz.: Histaglobin; Fr.: Algipan; Ger.: Histadestal; India: Algipan; Histaglobulin; Neth.: Cremor capsic comp. Cremor Capsici compositus; Kruidvat Spierbalsem; Pol.: Histaglobulin; Port.: Midalgan; S.Afr.: Histaglobin; Infrarub; Switz.: Midalgan; Radalgin.

# Histoplasmin

Histoplasmina.

# Pharmacopoeias. In US.

USP 31 (Histoplasmin). A clear, colourless, sterile solution containing standardised culture filtrates of Histoplasma capsulatum grown on liquid synthetic medium. It may contain a suitable antimicrobial. Store at 2° to 8°. The expiry date is not later than 2 years after release from the manufacturer's cold storage.

Histoplasmin, in an intradermal (intracutaneous) dose of 0.1 mL of a 1 in 100 dilution, may be used as an aid to the diagnosis of histoplasmosis. However, the diagnostic value of the test has been questioned and it may interfere with serological tests for

Histoplasmin has also been used, in conjunction with other antigens, to assess cell-mediated immunity.

## **Preparations**

USP 31: Histoplasmin.

Proprietary Preparations (details are given in Part 3) USA: Histolyn-CYL