volin; ***Mex.:*** Dalisol; Flynoken A†; Ifavor; Medsavorina; Precileucin; ***Neth.:*** Rescuvolin; VoriNa; ***Norw.:*** Isovorin; Rescuvolin; ***NZ:*** Rescuvolin†; ***Philipp.:*** Folinoxan; Litacor; Lovorin; Rescuvolin; ***Port.:*** Folinovo; Isovorin; Lederfoline; Medifolin; Raycept; Sodiofolin; VoriNa; ***Rus.:*** Dalisol (Далижол)†; ***S.Afr.:*** Isovorin; Rescuvolin; ***Singapore:*** Rescuvolin†; ***Spain:*** Cromatonbic Folinico; Folaxin; Folidan; Isovorin; Lederfolin; ***Swed.:*** Isovorin; Rescuvolin†; ***Thai.:*** Dalisol; Folina; Rescuvolin; ***Turk.:*** Antrex; Rescuvolin; ***UK:*** Isovorin; Lederfolin†; Refolinon; Sodiofolin; ***Venez.:*** Leuconolver.

Multi-ingredient: ***Gr.:*** Fysiofol; ***Ital.:*** Carfosid; Emazian B12†; Emoantitossina†; Emopon; Eparmefolin; Ferritin Complex; Ferrofolin; Hepa-Factor; Idropan B†; Ipavit†; ***NZ:*** Orzel†.

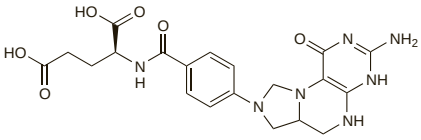
Folitixorin *(pINN)*

Folitixorina; Folitixorine; Folitixorinum; 5,10-Methylenetetrahydrofolate; 5,10-Methylenetetrahydrofolic acid; Tetrahydromethylenefolate. N-{4-[3-Amino-1,2,5,6,6a,7-hexhydro-1-oxoimidazo(1,5-f)pteridin-8(9H)-yl]benzoyl}-L-glutamic acid.

Фолитиксорин

$C_{20}H_{23}N_7O_6$ = 457.4.

CAS — 3432-99-3.



Profile

Folitixorin is an active metabolite of folinic acid. It is under investigation for use with fluorouracil in the treatment of pancreatic cancer and metastatic colorectal cancer.

Fructose

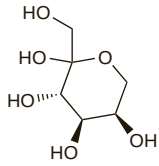
Fructosa; D-Fructose; Fructosum; Fruit Sugar; Fruktoosi; Fruktos; Fruktosa; Fruktóz; Fruktoza; Fruktozė; Laevulose; Laevulosum; Levulose. D-(−)-Fructopyranose.

$C_6H_{12}O_6$ = 180.2.

CAS — 57-48-7.

ATC — V06DC02.

ATC Vet — QV06DC02.



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

USNF includes High Fructose Corn Syrup.

Ph. Eur. 6.2 (Fructose). A white or almost white, crystalline powder with a very sweet taste. Very soluble in water; soluble in alcohol.

USP 31 (Fructose). Colourless crystals or a white crystalline powder. Is odourless and has a sweet taste. Freely soluble in water; soluble 1 in 15 of alcohol and 1 in 14 of methyl alcohol.

USNF 26 (High Fructose Corn Syrup). A sweet, nutritive saccharide mixture prepared as a clear, aqueous solution from high-glucose-equivalent corn starch hydrolysate by the partial enzymatic conversion of glucose to fructose, using an insoluble glucose isomerase enzyme preparation. It is available in two types, 42% and 55%, based on fructose content. Store in airtight containers.

Adverse Effects

Large doses of fructose given by mouth may cause flatulence, abdominal pain, and diarrhoea. Lactic acidosis and hyperuricaemia may follow intravenous infusions; fatalities have occurred.

Gout. Fructose may increase serum concentrations of uric acid, especially in those with existing hyperuricaemia or gout. A large cohort study found that consumption of fructose was associated with an increased risk of gout in men. Fructose-rich fruits or fruit juice may also increase the risk.[1] It has been pointed out that fructose intake has increased in the USA, where soft drinks are usually sweetened with high fructose corn syrup (also known as isoglucose), whereas elsewhere they tend to be sweetened with sucrose.[2]

1. Choi HK, Curhan G. Soft drinks, fructose consumption, and the risk of gout in men: prospective cohort study. *BMJ* 2008; **336:** 309–12.
2. Underwood M. Sugary drinks, fruit, and increased risk of gout. *BMJ* 2008; **336:** 285–6.

Hypersensitivity. Urticaria associated with the ingestion of certain foods by a patient was found to be caused by D-psicose, a minor constituent of high-fructose syrup, which is used as a sweetening agent.[1]

1. Nishioka K, *et al*. Urticaria induced by -psicose. *Lancet* 1983; **ii:** 1417–18.

Precautions

Fructose should not be given to patients with hereditary fructose intolerance.

It should be given with caution to patients with impaired kidney function or severe liver damage.

Intravenous administration. Reiterations of the view that the use of intravenous infusions containing fructose and sorbitol, which remained popular in some countries, should be abandoned.[1,2] Not only can they lead to life-threatening build-up of lactic acid, they have led to fatalities in patients with undiagnosed hereditary fructose intolerance.

1. Collins J. Time for fructose solutions to go. *Lancet* 1993; **341:** 600.
2. Committee on Safety of Medicines/Medicines Control Agency. Reminder: fructose and sorbitol containing parenteral solutions should not be used. *Current Problems* 2001; **27:** 13. Also available at: http://www.mhra.gov.uk/home/idcplg?IdcService=GET_FILE&dDocName=CON007456&RevisionSelectionMethod=LatestReleased (accessed 21/07/08)

Pharmacokinetics

Fructose is absorbed from the gastrointestinal tract but more slowly than glucose. It is metabolised more rapidly than glucose, mainly in the liver where it is phosphorylated and a part is converted to glucose; other metabolites include lactic acid and pyruvic acid. Although the metabolism of fructose is not dependent on insulin, and insulin is not considered necessary for its removal from the blood, glucose is a metabolic product of fructose and requires the presence of insulin for its further metabolism.

Uses and Administration

Fructose is sweeter than sucrose or sorbitol. It is used as a sweetener in foods for diabetics (although it is not clear it offers any advantage over sucrose); in the UK it has been advised that the intake of fructose be limited to 25 g daily in persons with diabetes mellitus.

Fructose has been used as an alternative to glucose in parenteral nutrition but its use is not recommended because of the risk of lactic acidosis. Use by intravenous infusion in the treatment of severe alcohol poisoning is also no longer recommended.

Solutions of fructose with glucose have been used in the treatment of nausea and vomiting (p.1700) including vomiting of pregnancy. Fructose is also used as a dissolution enhancer and tablet diluent in pharmaceuticals.

Pain. Oral fructose solution was considered to be as effective as oral glucose solution (p.1946) in alleviating mild pain in neonates.[1]

1. Akçam M. Oral fructose solution as an analgesic in the newborn: a randomized, placebo-controlled and masked study. *Pediatr Int* 2004; **46:** 459–62.

Preparations

BP 2008: Fructose Intravenous Infusion;
USP 31: Fructose and Sodium Chloride Injection; Fructose Injection.

Proprietary Preparations (details are given in Part 3)
Hung.: Fructosol; ***Ital.:*** Fructal†; Fructan; Fructofin; Fructopiran†; Fructosil; Laevosan†; ***Spain:*** Levulosado†.

Multi-ingredient: ***Arg.:*** High Energy; ***Austral.:*** Emetrol†; ***Braz.:*** Biofrut†; Dramin B-6 DL; ***Fr.:*** Filigel; ***Hung.:*** Fructosol E†; ***Indon.:*** Gastro-Ad; ***Israel:*** Peptical; ***Ital.:*** Eparema-Levul; Giflorex; Liozim; ***USA:*** Emetrol; Formula EM; Nausetrol.

Gleptoferron *(BAN, USAN, rINN)*

Gleptoferrón; Gleptoferronum; Iron Heptonate.

Γλεπτοφερρον

$C_7H_{14}O_8.(C_6H_{10}O_5)_n.FeOOH$.

CAS — 57680-55-4.

ATC Vet — QB03AC91.

Profile

Gleptoferron is a macromolecular complex of ferric hydroxide and dextran-glucoheptonic acid. It has been used for iron-deficiency anaemia in veterinary medicine. It is given by intramuscular injection.

Glucose

Dekstoz Monohidrat; Glucosa; Glukoz; Glukoza; Gukoz.

ATC — B05CX01; V04CA02; V06DC01.

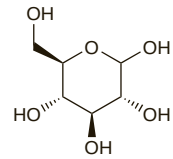
ATC Vet — QB05CX01; QV04CA02; QV06DC01.

Anhydrous Glucose

Anhydrous Dextrose; Anhydrous Glucose; Dextrosum Anhydricum; Gliukozė, bevandenė; Glucosa anhidra; D-Glucose; Glucose anhydre; Glucosum; Glucosum anhydricum; Glukoosi, vedetön; Glukos, vattenfri; Glukosa; Glukoza bezwodna; Vízmentes glükóz. D-(+)-Glucopyranose.

$C_6H_{12}O_6$ = 180.2.

CAS — 50-99-7.



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

Some pharmacopoeias include anhydrous glucose and/or glucose monohydrate as separate monographs whereas others permit the anhydrous and/or monohydrate under a single monograph.

Ph. Eur. 6.2 (Glucose, Anhydrous). A white or almost white, crystalline powder with a sweet taste. Freely soluble in water; sparingly soluble in alcohol.

The BP 2008 directs that when Glucose Intravenous Infusion is required as a diluent for official injections or intravenous infusions, Glucose Intravenous Infusion 5% should be used.

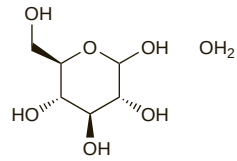
USP 31 (Dextrose). It contains one molecule of water of hydration or is anhydrous. Colourless crystals or white, crystalline or granular powder. It is odourless and has a sweet taste. Soluble 1 in 1 of water and 1 in 100 of alcohol; very soluble in boiling water; soluble in boiling alcohol.

Glucose Monohydrate

Dextrosum Monohydridicum; Gliukozė monohidratas; Glucosa monohidrato; Glucose monohydraté; D-Glucose Monohydrate; Glucosum monohydricum; Glukoosimonohydraatti; Glukosa monohydrát; Glukosmonohydrat; Glükóz-monohidrát; Glycosum; Grape Sugar. D-(+)-Glucopyranose monohydrate.

$C_6H_{12}O_6.H_2O$ = 198.2.

CAS — 5996-10-1.



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

Some pharmacopoeias include anhydrous glucose and/or glucose monohydrate as separate monographs whereas others permit the anhydrous and/or monohydrate under a single monograph.

Eur. includes Glucose, Liquid and Glucose, Liquid, Spray-dried. *USNF* includes Dextrose Excipient, Liquid Glucose, and Corn Syrup Solids.

Ph. Eur. 6.2 (Glucose Monohydrate; Glucose BP 2008). A white or almost white crystalline powder with a sweet taste. Freely soluble in water; sparingly soluble in alcohol.

Ph. Eur. 6.2 (Glucose, Liquid). A clear, colourless, or brown viscous liquid containing a mixture of glucose, oligosaccharides, and polysaccharides obtained by hydrolysis of starch, in aqueous solution. It contains not less than 70.0% of dry matter. Miscible with water. It may partly or totally solidify at room temperature, liquefying again on heating to 50°.

Ph. Eur. 6.2 (Glucose, Liquid, Spray-dried). A white or almost white, slightly hygroscopic powder or granules. Freely soluble in water.

USP 31 (Dextrose). It contains one molecule of water of hydration or is anhydrous. Colourless crystals or white, crystalline or granular powder. It is odourless and has a sweet taste. Soluble 1 in 1 of water and 1 in 100 of alcohol; very soluble in boiling water; soluble in boiling alcohol.

USNF 26 (Dextrose Excipient). A sugar usually obtained by hydrolysis of starch. It contains one molecule of water of hydration. Colourless crystals or white, crystalline or granular powder. Freely soluble in water; very soluble in boiling water; slightly soluble in alcohol; sparingly soluble in boiling alcohol.

USNF 26 (Liquid Glucose). It is obtained by incomplete hydrol-