Glucose, Liquid

1 Nonproprietary Names

BP: Liquid Glucose

PhEur: Glucose, Liquid

USP–NF: Liquid Glucose

2 Synonyms

Corn syrup; C*PharmSweet; *Flolys*; *Glucomalt*; *Glucoplus*; glucose syrup; glucosum liquidum; *Glucosweet*; *Mylose*; *Roclys*; starch syrup.

3 Chemical Name and CAS Registry Number

Liquid glucose [8027-56-3]

4 Empirical Formula and Molecular Weight

See Section 8.

5 Structural Formula

See Section 8.

6 Functional Category

Coating agent; sweetening agent; tablet and capsule binder.

7 Applications in Pharmaceutical Formulation or Technology

Liquid glucose is used as a base in oral solutions and syrups and also as a granulating and coating agent in tablet manufacture. In sugar solutions for tablet coating, liquid glucose is used to retard the crystallization of the sucrose. *See* Table I.

Liquid glucose has been investigated as a filler in dry foam tablets to improve the dissolution behavior of poorly soluble drugs.[1]

Table I: Uses of liquid glucose.

Use	Concentration (%)
Granulating agent	5–10
Oral syrup vehicle	20–60
Tablet coating	10–20

8 Description

Liquid glucose is an aqueous solution of several compounds, principally dextrose, dextrin, fructose, and maltose, with other oligosaccharides and polysaccharides. It is a colorless, odorless, and viscous sweet-tasting liquid, ranging in color from colorless to straw-colored.

Liquid glucose is classified into four categories according to its degree of hydrolysis, expressed as dextrose equivalent (DE):

Type I: 20–38 DE;

Type II: 38–58 DE;

Type III: 58–73 DE;

Type IV: >73 DE.

9 Pharmacopeial Specifications

See Table II.

Table II: Pharmacopeial specifications for liquid glucose.

Test	PhEur 9.2	USP 40–NF 35 S1
Identification	+	+
Characters	+	–
Acidity	–	+
pH	4.0–6.0	–
Water	≤30.0%	≤21.0%
Residue on ignition	≤0.5%	≤0.5%
Sulfur dioxide	≤20 ppm[a]	–
Sulfite	–	+
Heavy metals	–	≤10 µg/g
Starch	–	+
Assay for reducing sugars (dextrose equivalent)	≥20% of nominal value	90.0–110.0%
Assay (of dried matter)	≥70.0%	–
Sulfated ash	≤0.5%	–

(a) Or ≤400 ppm if intended for the production of hard boiled candies, provided the final product contains ≤50 ppm.

10 Typical Properties

Density 1.43 g/cm^3 at 20°C

Solubility Miscible with water; partially miscible with ethanol (90%).

Viscosity (dynamic) 13.0–14.5 mPa s (13.0–14.5 cP) at 21°C.

11 Stability and Storage Conditions

Liquid glucose should be stored in a well-closed container in a cool, dry place. Elevated temperatures will cause discoloration.

12 Incompatibilities

Liquid glucose is incompatible with strong oxidizing agents.

13 Method of Manufacture

Liquid glucose is prepared by the incomplete acidic or enzymatic hydrolysis of starch.

14 Safety

Liquid glucose is used in oral pharmaceutical formulations and confectionery products and is generally regarded as a nontoxic and nonirritant material.

See also Dextrose and Dextrose Anhydrous.

LD_{50} (mouse, IV): 9 g/kg[2]

LD_{50} (rat, oral): 25.8 g/kg[2]

15 Handling Precautions

Observe normal precautions appropriate to the circumstances and quantity of material handled.

16 Regulatory Status

Included in the FDA Inactive Ingredients Database (oral solutions, syrups, and tablets). Included in nonparenteral medicines licensed in the UK. Included in the Canadian Natural Health Products Ingredients Database.