49139/49163 D-(+)-Glucose anhydrous (Dextrose, Grape Sugar)

CAS number: 50-99-7

Product Description:

Molecular formula:	$C_6H_{12}O_6$
Formula weight:	180.16 g/mol
Mp:	146°C (α-D-glucose) 150°C (β-D-glucose)[1]
Solubility:	1 M in H_2O, 20°C, complete, colorless
pH:	6.0-8.0 (1 M in H_2O, 25°C) 5.9 (0.5 M aqueous)[2]
$[\alpha]_D^{20}$:	+53 ± 2° (3h; c = 10 in H_2O)
$[\alpha]_{546}^{20}$:	+62 ± 2° (3h; c = 10 in H_2O)

49139 BioUltra
49163 BioUltra for molecular biology (20% in water)

The products designated as "BioUltra" grade are suitable for different applications like purification, precipitation, crystallisation and other applications which require tight control of elemental content. Trace elemental analyses have been performed for both qualities. The molecular biology quality is also tested for absence of nucleases. The Certificate of Analysis provides lot-specific results.

Glucose is a main source of energy for living organisms. Glucose occurs naturally in the free state in fruits and other parts of plants. Glucose is combined into glucosides, disaccharides, oligosaccharides, the polysaccharides (cellulose and starch), and glycogen. Glucose is a mixture of α- and β-anomers, primarily the α-anomer. The optical rotation of the α-anomer is +112.2° (c = 10% in water, 20 °C) and the β-anomer is +18.7° (c = 10% in water, 20 °C). When D-glucose is dissolved in water, the optical rotation gradually changes (mutarotates) with time and approaches a final equilibrium value of +52.7° (c = 10%, 20 °C) due to the formation of an equilibrium mixture consisting of approximately one-third α- and two-thirds β-D-glucose.[2] Normal human blood contains 0.08-0.1% glucose.[2] Small amounts of glucose can be measured using luminol as a substrate with horseradish peroxidase.[3]

Applications:
Glucose can be used for biotechnological purposes like fermentation in bioreactors. Glucose is used in several applications e.g. as buffer component or as substrate for microorganisms and cells. Neutralizes growth inhibition by myxothiazol in Saccharomyces cerevisiae, Mucor hiemalis and Candida albicans.[5] It is also used as a component of the stationary phase in chromatography columns for separation of isomers.[6]

Preparation Instructions
One gram of glucose dissolves in 1.1 ml of water at 25°C and in 0.18 ml of water at 90°C.[2]

Storage/Stability
Store at room temperature. Solutions can be autoclaved.[4]

References

1. Biochemistry, 2nd ed., Lehninger, A. L., ed., Worth Publishers, Inc. (New York, NY: 1975), p. 253.
2. The Merck Index, 13th Ed., Entry# 4472.
3. Puget, K., and Michelson, A.M., Microestimation of glucose and glucose oxidase. Biochimie, 58, 757-758 (1976).
4. Martindale The Extra Pharmacopoeia, 29th ed., Reynolds, J. E. F., ed., The Pharmaceutical Press (London, England: 1989), p. 1265.
5. G. Thierbach, H. Reichenbach, Antimicrob. Agents Chemother. 19, 504 (1981)
6. A. Ono, Component of the liquid stationary phase in the GLC separation of nitroxylene and xylenol isomers, J. Chromatogr. 197, 251 (1980)

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.