

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 41b

Dextrose

B. Coxon and R. Schaffer

This Standard Reference Material is certified as a chemical of known purity and is intended primarily for use in calibrating polarimetric systems and as an oxidation-reduction standard in the identification of sugars and sugar derivatives.

Specific rotation of 20.0 g of this SRM in 100 mL of aqueous solution:

$$[\alpha]_{589}^{20} = 925 \text{ mrad } (53.0^\circ) \pm 1 \text{ mrad (equilibrium value).}$$

$$[\alpha]_{546}^{20} = 1091 \text{ mrad } (62.5^\circ) \pm 1 \text{ mrad (equilibrium value).}$$

Specific rotation of 10.0 g of this SRM in 100 mL of dimethyl sulfoxide solution:

$$[\alpha]_{589}^{20} = 1984 \text{ mrad } (113.7^\circ) \pm 2 \text{ mrad (initial value).}$$

The uncertainties are the standard deviations of 8 measurements.

α -D-Glucopyranose and β -D-Glucopyranose were determined in freshly prepared solutions of the dextrose in dimethyl sulfoxide- d_6 by proton magnetic resonance spectroscopy at 90 MHz, and by carbon-13 magnetic resonance spectroscopy at 22.6 MHz. The moisture content was determined by the Karl Fischer method, and the ash content by ignition of 25-g samples.

α -D-Glucopyranose	greater than 99.0 percent
β -D-Glucopyranose	less than 1.0 percent
Moisture	0.07 percent
Ash	0.002 percent

On exposure to air, dextrose absorbs moisture that can be removed by drying in a vacuum at 60 to 70 °C. No organic impurities were revealed by paper chromatography or thin-layer chromatography of this material.

This dextrose was obtained from Pfanstiehl Laboratories, Inc., of Waukegan, Illinois. Analyses were performed at the National Bureau of Standards by B. Coxon, E.R. Deardorff, S.A. Margolis, and R.C. Reynolds.

The technical and support aspects concerning the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by R.K. Kirby.