CAPSULES
preliminary notes and applications from Bioanalytical Systems, Inc.

LCEC Determination Of Glucose In Blood

Purpose

Determination of glucose in blood, mainly for patients who suffer from diabetes mellitus. In emergency cases physicians need to quickly know whether the patient is in diabetic coma or hypoglycemic shock.

Existing Methods

Aromatic amine methods, Oxidation methods, Enzymatic methods, Paper strip reflectometers. Aromatic amine methods giving colored derivatization products are not sensitive (0.5 mL serum used). Widely used oxidation methods suffer from interference by air and require a protein-free sample. Some enzymatic methods suffer from interference from ascorbic acid, uric acid, and other reducing agents.

LCEC Method

Offers an accurate, selective, sensitive and very rapid method without any prior sample treatment except dilution. Minimum sample size is 1 µL. Less than 90 seconds are needed per sample.

Conditions

System: BAS 400 Glucose Analyzer
Column: BAS ODS column (5 µm, 30 x 4.6 mm) and glucose oxidase reactor column (IMER), both maintained at 35°C with a LC-23B column temperature controller.
Mobile Phase: 20 mM NaH_2PO_4, 0.05% dimethylhexylamine, pH 5.5
Electrode: anionic membrane coated Pt
Potential: +700 mV vs Ag/AgCl
Detection Limit: 300 pg glucose injected, at a S/N of 3. The injection volume was 20 µL.
Linear Range: Up to 500 ng injected (a larger amount was not tested)

Sample Preparation

Dilute serum with 200-1000 volumes of mobile phase, directly inject 20 µL into the Glucose Analyzer.

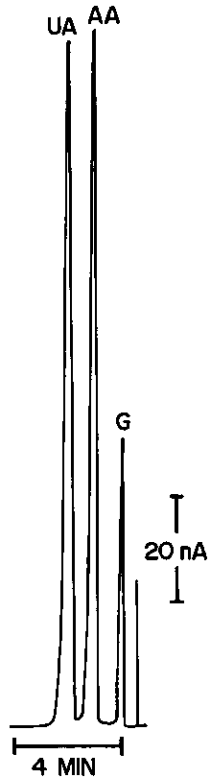

Figure 1. Glucose (G), ascorbic acid (AA), uric acid (UA) standards using a bare Pt electrode, 40 ng of each injected.

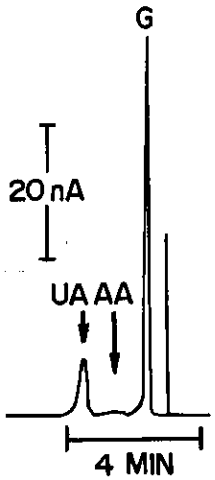

Figure 2. Glucose in serum using a bare Pt electrode, 500-fold dilution. 20 µL injected.

2701 Kent Ave • W. Lafayette, IN 47906 • (317) 463-4527 • TEL: 276141 • FAX (317) 497-1102

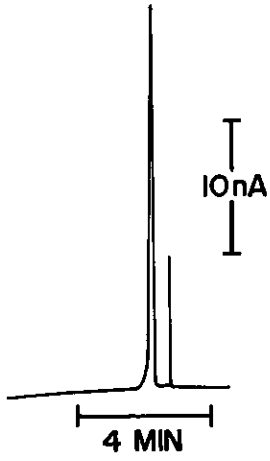

Figure 3. Glucose in serum using a coated Pt electrode, 500-fold dilution, 20 µL injected.

NOTE: The precision is dependent upon Pt electrode preparation and coating. Please contact BAS for further information about the electrode treatment technique.

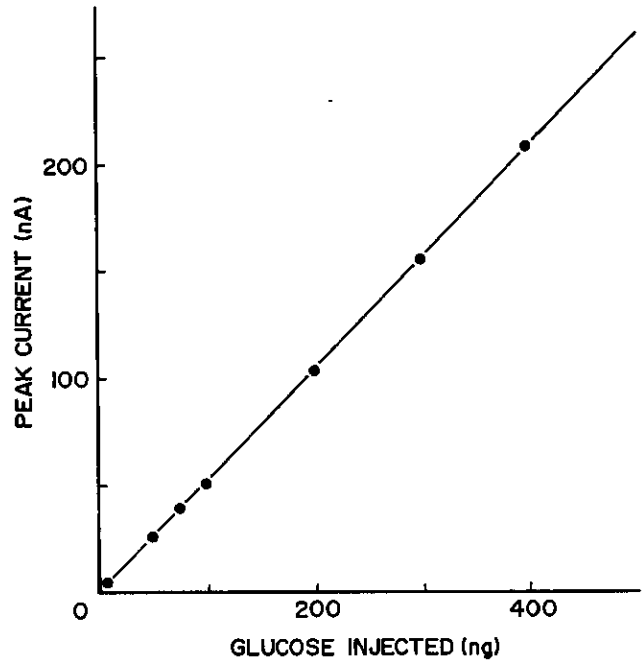

Figure 4. Glucose Calibration Curve using a bare Pt electrode.

COPYRIGHT 1988, Bioanalytical Systems, Inc.