INTRODUCTION
Dextrose (D-glucose) concentrations in complex matrices such as frozen green beans can be measured directly and quickly using the YSI 2900 Series Biochemistry Analyzer. YSI's unique enzyme technology provides for specific glucose measurement. Measurements are virtually unaffected by color, turbidity, density, pH, or the presence of reducing substances.

When a sample is injected into the sample chamber, the glucose diffuses into the membrane containing glucose oxidase. The glucose is immediately oxidized to hydrogen peroxide and D-glucono-δ-lactone. The hydrogen peroxide is detected amperometrically at the platinum electrode surface. The current flow at the electrode is directly proportional to the hydrogen peroxide concentration, and hence to glucose concentration.

I. MATERIALS & SETUP
A. YSI 2900 Series Biochemistry Analyzer - equipped with a 2365 Glucose Membrane and 2357 Buffer.
B. Glucose standards (2.50 g/L, 9.00 g/L).
C. Buffer Diluent (40 g/L NaH₂PO₄, 10 g/L Na₂HPO₄ in reagent water).
D. Connect the 2900 Series instrument to a suitable power source.
E. Perform the instrument and membrane daily checks described in the Operations Manual.
F. Volumetric glassware (Class A recommended).
G. The following instrument setup is recommended:
   Sample Size 25 μL
   Probe A Parameters
   - Chemistry: Glucose
   - Unit: g/L
   - Calibrator: 2.50 g/L
   - End Point: 30 Sec

II. METHOD
A. Weigh up to 25.00 g of green beans to be analyzed, add 50 mL of buffer.
B. Transfer the sample a clean dry blender. Blend until the sample is liquid.
C. Transfer the sample to a 100mL volumetric flask using buffer diluent to rinse and dilute. Fill the flask to the mark with buffer. Allow the solution to equilibrate for about twenty minutes before analysis.
D. Calibrate the 2900 Series instrument with a 2.50 g/L glucose standard solution.
E. Check the linearity of the membrane at least once a day by injection of a glucose linearity check solution (9.00 g/L). Refer to the Operators Manual for specifications.
F. Assay the sample prepared in C by aspiration into the 2900 Series. The linear range of the system is 0.05 to 9.00 g/L glucose. If the value reported exceeds this, further dilution is required.*

* The linearity of glucose on the 2900 Series can be increased to 0.05 to 25.0 g/L. This can be done by decreasing the sample size to 10μL and checking the linearity with 25.0 g/L standard.

G. Calibrate frequently as described in the Operations Manual.

III. CALCULATIONS
To calculate % glucose, multiply the reported value by the appropriate dilution factor.

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Example: 27.22 grams of frozen green beans were diluted to 100 mL in a Class A volumetric flask. When assayed, the value reported was 2.20 g/L glucose.

% Glucose:
\[
\frac{2.20 \text{ g/L} \times 0.100 \text{L}}{27.22 \text{ g}} = 0.0081 \text{ g glucose/g green beans} = 0.81\% \text{ (w/w)}
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