

Food & Beverage Series

DETERMINATION OF HYDROGEN PEROXIDE

Application Note 208LS

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INTRODUCTION

Hydrogen peroxide can be measured quickly using the YSI 2900 Series Biochemistry Analyzer. YSI's unique technology provides for rapid hydrogen peroxide determination. Measurements are virtually unaffected by color, turbidity, density, or pH.

When a sample is injected into the sample chamber, the hydrogen peroxide diffuses to the platinum electrode and is oxidized. The current flow at the electrode is directly proportional to hydrogen peroxide concentration. The blank membrane placed over the electrode surface rejects potential interfering substances.

Low molecular weight phenols, mercaptans, hydroxylamines, hydrazines, and anilines can be electrochemical interferences. Refer to the Operations Manual for specifics.

I. MATERIALS & SETUP

A. YSI 2900 Series Biochemistry Analyzer - equipped with a 2701 Blank Membrane and 2357 Buffer.

B. Hydrogen Peroxide Standards. YSI does not offer hydrogen peroxide standards. Prepare a calibration standard with a hydrogen peroxide concentration near the expected assay value of the sample, however, the calibration standard must produce more than 5 nA of current. In general, about 15 ppm (mg/L) hydrogen peroxide is the lower limit for a calibration standard.

   A linearity standard can also be prepared. Target a concentration that reflects the highest hydrogen peroxide concentration of the samples being analyzed.

C. Connect the 2900 Series instrument to a suitable power source..

D. Perform the instrument and membrane check described in the Operations Manual (Section 5).

E. Volumetric glassware (Class A recommended).

F. The following instrument setup is recommended. Sample size 25 µL*

Probe A Parameters

Chemistry	Peroxide
Unit	mg/L (ppm)
Calibrator	~30 (see section B above)
End Point	30 Sec

* The sample volume can be changed to meet the specific needs. Low hydrogen peroxide concentrations will require larger sample volumes.

** The calibration solution should be stored and sampled from glass containers. However, if the solution is prepared and used the same day, calibrate from Station #2 and sample from test tubes.

II. METHOD

A. Dilute samples with distilled water to bring the hydrogen peroxide concentration below 300 ppm.

B. Calibrate the 2900 Series instrument with the hydrogen peroxide calibration standard prepared in II.B.

C. If desired, check the linearity of the membrane by injection of the linearity solution prepared in II.B. Typically, hydrogen peroxide response is linear from 3 to 300 ppm.

D. Assay the sample prepared in III.A. by aspiration into the 2900 Series. If the value reported exceeds 300 ppm, dilute the sample further.

E. Calibrate frequently as described in the Operations Manual (Section 7).

III. CALCULATIONS

To calculate % hydrogen peroxide, multiply the reported value by the appropriate dilution factor.

Example: 10.0 ml of sample was diluted to 100 mL in a Class A volumetric flask. When assayed, the value reported was 220 mg/L (ppm). *continued*

Hydrogen Peroxide in original sample:
22 mg/L x 0.100L/0.010L = 2200 mg/L (ppm)

ODERING INFORMATION

YSI Part Numbers:

2900	Biochemistry Analyzer
2701	Blank Membrane Kit
2357	Buffer Kit
2363	Potassium Ferrocyanide Test Solution
2392	NaCl Solution (for membrane installation)

For further information, please contact:

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