



Thermo

ELECTRON CORPORATION

Potentiometric Titration Application Notes

Applications Log # 205

Overview

Boron concentrations were determined in the ranges of 10-2000 ppm by using a single titrant. Analysis was done using the Preset endpoint technique with an Orion pH electrode. Using the sodium hydroxide as the titrant, the Orion 960 Autochemistry System determines the endpoint and calculates the concentration of boron in the sample.

Industry	Chemical Industry
Species Measured	Boron
Sample	Boron Standards
Sample Size	50mL
Typical Concentration	10ppm
Technique	# 8 Preset endpoint
Electrode	Ross Sure-Flow pH 8172BN
Solutions	0.025M sodium hydroxide; 0.5M hydrochloric acid; mannitol
Sample Prep	The analysis was done with 10 and 2000 ppm boron standards. The 2000 ppm standard was diluted 1:200 to make a 10 ppm standard. For 10 ppm weigh 50 mL of sample, add 0.1 mL of 0.5 M HCl to bring the pH below 5.5. Program two methods in sequence for this analysis. Titrate sample to preset endpoint of pH 5.5. During "wait" period between methods add 5 g of mannitol to sample, titrate to preset endpoint of pH 8.0. For 2000 ppm range, weigh 1 g of sample, add 50 mL of DI water and titrate as above.

Statistics

# of Trials	5	Mean	10.19ppm	%CV	0.34
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Analysis Time 7.8minute(s)

Comments Rinse the electrodes, stirrer, and dispenser probe between measurements with deionized water. Use unit of measurement as ppm (w).

Method Parameters

Sample Volume/Weight	0.90 g	Timed or Stability Readings	5.0 second(s) timed
Constant Increment	8.0 mV	Number of Endpoints	1
Max Titrant Volume	30.00 mL	Desired Units	ppm - w
Molecular weight	10.81 g	Predose	
Prestir	1.0 second(s)	Additional Parameters	
Reaction Ratio	1.00		