



Parameter

Fluoride

Sample Type

Mouthwash

Introduction

This method provides rapid, uncomplicated determinations for fluoride in the form of sodium fluoride in whitening fluoride mouthwash. This procedure eliminates interferences associated with presence of color. The direct measurement of fluoride ion with the fluoride ion selective electrode is a well-established technique that is frequently used as a standard method of analysis

Result Statistics

| # Trials | Average | %CV |
|----------|------------|------|
| 5 | 0.283% w/v | 0.68 |

Recommended Equipment

4-Star Benchtop pH/ISE meter (Orion 1115000); ionplus[®] fluoride electrode (Orion 9609BNWP); ATC probe (Orion 927007MD); Benchtop stirrer (Orion 096019)

Required Solutions

Fluoride Standard, 100ppm as F (Orion 940907); Fluoride Standard, 0.1M NaF (Orion 940906); Reference Filling Solution, Optimum Results[™] A (Orion 900061); TISAB II (Orion 940909) deionized water (DI).

Solutions Preparation

Prepare a 950ppm standard by pipetting 50mL of the 0.1M NaF into 100mL flask and diluting up with deionized water. Prepare a calibration standard by measuring 25mL of this 950ppm standard into a beaker and adding 25mL of TISAB II. A second calibration standard is prepared by measuring 25mL of the 100ppm standard into a beaker and adding 25mL of TISAB II to it.

Meter Setup

Connect the electrode, stirrer and ATC probe to the Star Meter. Set measurement mode to ISE. In Setup mode of Star Meter, set resolution to 3, turn off the non-linear blank correction, set the measurement range to high, select % as the unit and read type to continuous. If all steps were followed correctly the meter display will show three digits in the top line and "ISE: %" to the right of the top line. The temperature will also be displayed in the top left of the screen.

Electrode Setup

See the electrode manual for preparation of the electrode.

Electrode Performance Check

Check slope at least daily according to the electrode manual.

Electrode Storage, Soaking, and Rinsing

See electrode manual for storage 1) between measurements, 2) overnight, and 3) for long periods of time. Between measurements, rinse the electrode with DI water and dry outer sleeve of electrode before measuring the next sample. Do not wipe or rub the sensing element of the electrode, shake the electrode to dry the sensing element.

Sample Preservation

None required.

Sample Preparation

Use a graduated cylinder to measure 25mL of sample and pour into a beaker. Add 25mL of TISAB II to the sample. All standards and samples should be measured at the same temperature.

Calibration

Perform a two point calibration using the 100ppm (0.01%) and 950ppm (0.95%) fluoride standards. The electrode slope will be displayed and should be between -54 and -60mV/decade. Read a fresh portion of standards to verify calibration. If readings are not acceptable see troubleshooting section of manual.

Analysis

Rinse electrode, ATC probe and stirrer with DI water and shake to probe to dry. Place all probes in sample, turn on stirrer and measure. The concentration of the sample will be displayed. When a stable reading is achieved, the "ISE:%" icon will stop flashing.

Quality Control (QC)

Recommended QC procedures include: calibration and calibration verification, sample duplicates, and slope.



| Fluoride Mouthwash | % w/v Fluoride |
|--------------------|----------------|
| Sample 1 | 0.280 |
| Sample 2 | 0.282 |
| Sample 3 | 0.285 |
| Sample 4 | 0.284 |
| Sample 5 | 0.283 |
| | |
| Mean | 0.283 |
| Standard Deviation | 0.002 |
| %CV | 0.68 |