GLI Method Summary

Determination of Total Fluorine by Oxygen Flask
Combustion and Ion-Selective Electrode

Governing SOP: E9-3 Rev 15

Analyte: F

Summary
Fluorine can be converted to fluoride by combusting the sample in an oxygen flask with a known volume of ionic strength adjustment buffer as an absorbing medium using procedure G-54. An ion-selective electrode determines the fluoride content.

Instrument
Orion Fluoride Electrode (9409); Orion Reference Electrode (90-01 Single-Junction); Fisher Accumet AR25 Ion Meter

Preparation
Combust 1-200 mg of sample in an oxygen rich atmosphere using a heavy wall oxygen flask that contains a known amount of buffer solution. Sucrose is used as a combustion aid.

Calibration
Make working standard solutions from the stock NaF 1000 µg/mL solution in concentrations of 10, 5, 2, 1, 0.5 µg/mL for high level, and 2, 1, 0.4, 0.2, 0.1 µg/mL for low level;

Determination
Direct readout in mg/L using an ion meter.

Precision & Accuracy
RSD
1.22

Interferences
Boron, metals that form insoluble fluorides such as Ca, Ba, and La (these must be distilled), and Hydroxides.

Calculations
\[ \frac{[(\text{sample conc.} \ \mu\text{g/mL}) \times (\text{dilution factor}) - *\text{blank conc.} \ \mu\text{g/mL}] \times (\text{prep volume, mL})}{\text{Sample weight, g}} = \mu\text{g/g F} \]

\[ \frac{[(\text{sample conc.} \ \mu\text{g/mL}) \times (\text{dilution factor}) - *\text{blank conc.} \ \mu\text{g/mL}] \times (\text{prep volume, mL})}{\text{Sample weight, mg} \times 10} = \% \text{ F} \]

References


EPA 340.2

Other GLI Procedures

E9   *Fluoride in Water or Water-soluble Solids by Specific Ion Electrode*
E9-3A *Determination of Fluorine by Pyrohydrolysis and Ion-Selective Electrode*