GLI Method Summary

Fluorine by Pyrohydrolysis and Ion-Selective Electrode

**Analyte:** F

**Preparation:**
The fluorine is separated from the sample by pyrohydrolysis in a quartz tube with a stream of wet oxygen at a temperature of 1100°C. A V$_2$O$_5$ accelerator is mixed with the sample to be pyrohydrolyzed. The fluorine is volatilized as hydrofluoric acid, absorbed in dilute caustic and measure with ion-selective electrode.

**Instrument:**
Orion Fluoride Electrode (90-01); Fisher Acumet Specific Ion Meter MP825; Thermolyne 21100 Tube Furnace

**Calibration:**
<table>
<thead>
<tr>
<th>Calibration Standards</th>
<th>Concentration Range</th>
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<tbody>
<tr>
<td>Low-Range Standard</td>
<td>0.2–2.0 µg F/mL (NaF solution)</td>
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<tr>
<td>Normal-Range Standard</td>
<td>0.5–10 µg F/mL</td>
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<tr>
<td>High-Range Standard</td>
<td>10–100µg F/mL</td>
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</tbody>
</table>

Enter each standard as direct concentration; automatic temperature compensation

**Control:**
NIST Phosphate rock (3.2% F)

**Determination:**
Direct readout

**Detection Limit:**
0.002%

**Interferences:**
Not known

**Calculations:**
\[
\%F = \frac{\left( \frac{\text{sample, } \mu g/\text{mL}}{\text{blank, } \mu g/\text{mL}} \right) \left( \text{prep volume, mL} \right)}{\left( 10 \right) \left( \text{sample wt, mg} \right)}
\]

\[
\mu g/ g, \text{ ppm F} = \frac{\left( \frac{\text{sample, } \mu g/\text{mL}}{\text{blank, } \mu g/\text{mL}} \right) \left( \text{prep volume, mL} \right)}{\left( \text{sample wt, g} \right)}
\]

**Precision and Accuracy:**

<table>
<thead>
<tr>
<th>RSD</th>
<th>RE</th>
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<tbody>
<tr>
<td>2.38%</td>
<td>0.63%</td>
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</table>

**Reference**
ASTM C-169-00

**Other GLI Procedures**
E9 Series