Introduction

The fluoride electrode only measures the activity of free fluoride ions. This means that the sample pH must be higher than 5.5, otherwise the fluoride ion is present in its acid form(HF) and not measurable Also, no complexing metals like aluminium and iron must be present, they will mask fluoride ions. The fluoride electrode also measures other anions, mainly hydroxyl ions which makes it imperative that the sample pH must be lower than 8.0, otherwise OH^- ions will interfere with the fluoride measurement.
If these conditions can not be maintained, a buffer solution containing a complexing agent must be added to the sample, usually the so called TISAB buffer is used.

Installation

For instrument mounting and power connections please see AMI ISE User's Manual

The flow cell M-Flow 10-3PG consists of the flow cell block [D] and the calibration vessel [F]. The Fluorid sensor [A] the temperature sensor [B] and the Reference sensor FL [C] are screwed into the flow cell block [D]. The sample enters at the sample inlet [I]. It flows through the deltaT flow sensor [E] (if installed) and then through the flow cell block into the calibration vessel [F], were Ammonium or Nitrate is measured. The Ammonium or Nitrate value depends on the sample temperature. The measuring value of the temperature sensor [B] is used to recalculate the Ammonium or Nitrate measuring value to a predefined average sample temperature.The sample leaves the calibration vessel via flow cell block through the sample outlet [G] and flows into the drain [H].

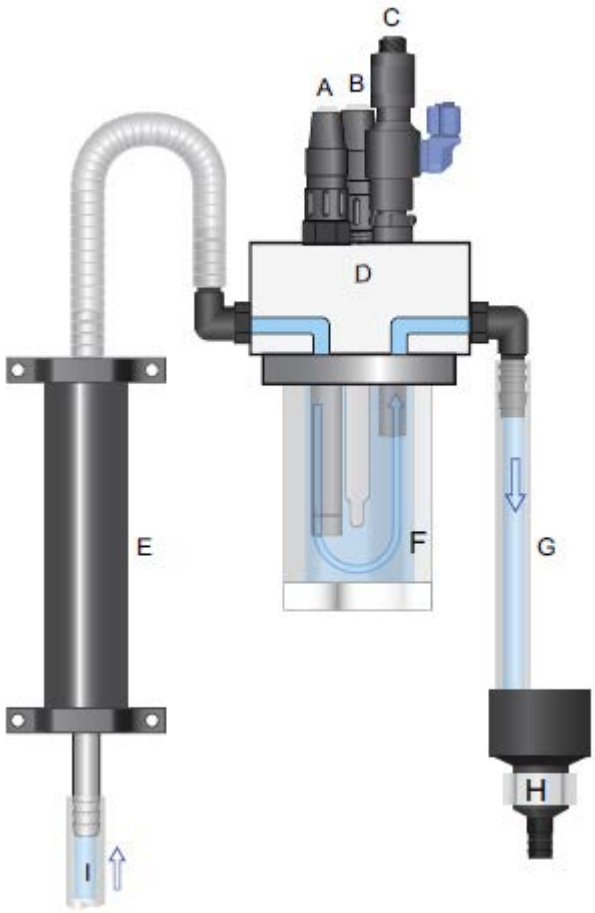

Fig 1.

Fig 1. Shows the fluidics of the AMI ISE Fluoride along with the components

A *Fluoride sensor*
B *Temperature sensor*
C *Reference electrode*
D *Flow cell block*
E *deltaT flow sensor (option)*
F *Calibration vessel*
G *Sample outlet*
H *Drain*
I *Sample inlet*

Sensor Installation

Take off the protective caps from the sensors measuring tip.

Attention: the cap of the reference electrode contains saturated KCl solution. Avoid spilling of the liquid.
Attention: Do not touch the sensing crystal of the fluoride electrode

- Screw the sensors into the holes of the measuring cell. Tighten slightly only!
- Remove the protective caps from the connectors.
- Put the cables onto the electrodes and screw the fixing cap finger tight. Cable marked with **S** (ion sensor) to fluoride electrode Cable marked with **R** (reference) to reference electrode.

Open the sample tap and adjust sample flow to about 10 l/h; let the sensors stabilize for 1 hour before calibrating the analyzer.

Care and Maintenance

Deposits of the single crystal can be removed carefully by wiping with a damp paper cloth. In this case, damage (scratches) on the crystal surface can be avoided. Then the sensor need to be conditioned in fluoride dilute solution (approx.. 10^{-2} mol / L) for 5 to 10 minutes.

Calibration

Calibrate the instrument weekly with a standard solution or a process calibration.

Fluoride Electrode

The fluoride electrode doesn't need special maintenance. Wipe the electrodes tip with a soft tissue every 4 weeks. If this does not fix the problem, check the reference electrode and or replace the fluoride electrode.

Reference Electrode

Wipe the electrodes tip with a soft tissue every 4 weeks. If this does not fix the problem, check the fluoride electrode and or replace the reference electrode. If the reference electrode should be sent back for a function check, fill some drops of clean water into the black rubber cap and put it on the electrode tip.

Attention: The reference electrode should be replaced yearly. It cannot be regenerated.
Attention: Never send back a reference electrode dry. It will be destroyed!

Storage

The fluoride electrode can be kept in the air or immersed in a diluted Fluoride solution. No electrode should be kept in TISAB containing solution!

Procedure for Maintaining the Membrane Tip

- Unscrew the old membrane module from the electrode shaft.
- Fill the electrode shaft with internal solution (make sure filling is bubble free).
- The membrane module also need to be filled with internal solution up to seal ring.
- Fixed and screwed the membrane module into the shaft.
- Once again, fixed firmly the electrode towards the electrode head (like a thermometer).
- Then rinse the entire electrode thoroughly with demineralized water. Subsequently conditioned the electrode in dilute Fluoride solution (about 10-2 mol / L) for 10 minutes.

Change of the Membrane Tip

Sensors with a damaged crystal, signified by long response time or unstable potentials, need to be replaced. Please contact support at support@swan-analytical-usa.com or your respective representative.