

## Determination of fluorine, chlorine and sulfur in toner

 Seat №.: **AQF\_EM\_015E**

Category :

 Instruments: **AQF-100**

Method : Combustion-ion chromatography

Related standard

Concentrations of fluorine, chlorine, bromine, iodine, and sulfur can be determined and accurately by using a combustion ion chromatography (CIC) system combining an Automatic Quick Furnace Model AQF-100 which safely combusts samples with an ion chromatograph.

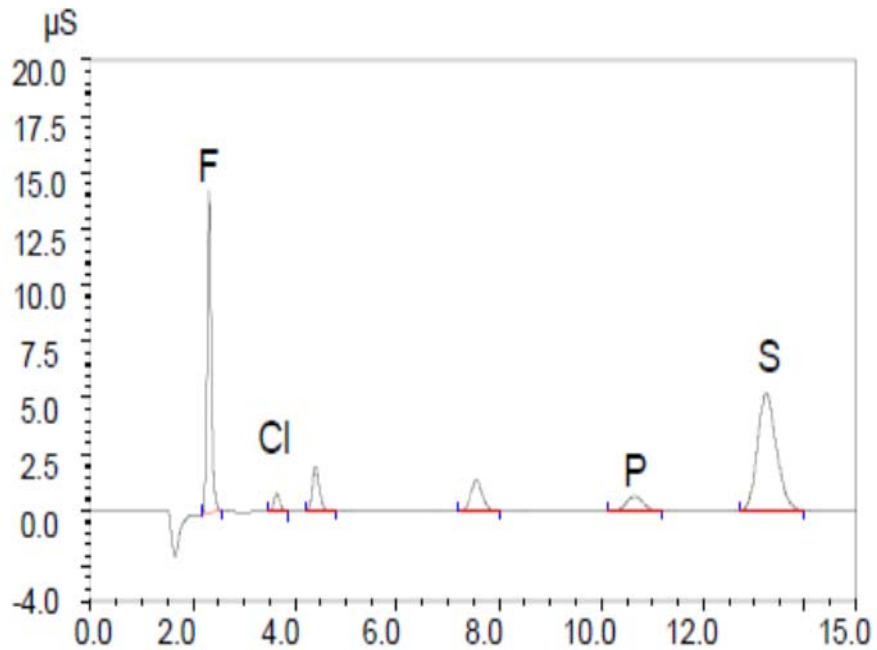
Sample name	Toner
Sample status	
Measuring items	Fluorine (F), Chlorine (Cl), Sulfur (S)
Measurement principle	<p>Sample is thermally decomposed in argon (Ar) atmosphere, then combusted in oxygen (O<sub>2</sub>) atmosphere. Halogens in the sample are converted to hydrogen halide and halogen gas and sulfur turns into sulfur oxide. These components are collected into absorbing solution and converted to halide ion and sulfate ion. The resulting solution is analyzed by injecting into an ion chromatograph (IC).</p> <p><b>Analyzing flow</b>        [Sample weighing] ⇒ [Combustion] ⇒ [Collection of combustion gas] ⇒ [IC analysis]</p>
Parameters	<p><b><u>1. AQF-100</u></b></p> <p>Sample size : 30mg        Sample boat : Ceramic sample boat, SXSMBS        Additive : None        Pyrolysis tube : Quartz tube filled with quartz wool        Absorbent : Hydrogen peroxide / water</p> <p>Heater Temp. Inlet : 900degC        Outlet : 1000degC        Gas flow Ar : 200 ml/min        O<sub>2</sub> : 400 ml/min</p> <p>GA-100 Absorbent volume : 5 ml        Sampling loop : 100 ul        Absorption tube : For 10 ml        Water supply : 2        Ar flow for water supply : 150 ml/min</p>

**2. Ion chromatograph**

Ion chromatograph : DIONEX ICS-1500  
 Column : DIONEX Ion Pack AG12A / Ion Pack AS12A  
 Eluent : 2.7mM Na<sub>2</sub>CO<sub>3</sub> / 0.3mM NaHCO<sub>3</sub>  
 Eluent flow : 1.50ml / min  
 Detector : Conductivity  
 Suppressor : ASRS-mm  
 Measuring time : 15min  
 Sampling loop : 100 ul using GA-210 sampling loop  
 Calibration : F Cl Br S : 0.1ppm to 5.0ppm

Results

**Chromatogram**



**測定値**

	F(ppm)	Cl(ppm)	S(ppm)
n=1	467	58.6	1560
2	462	54.6	1580
Average	465	56.6	1570

Remarks

- Handling of reagents: Confirm labels and safety data sheets of reagents and handle them with enough care.
- Automation is possible by using an Automatic Sample Changer, ASC-120S.
- When ASC-120S is used, the boat to be used will be a ceramic boat, TX3SCX.

• This application sheet is provided as reference, and does not assure the measurement results. Please consider analysis environment, external factors and sample nature for optimal conditions before the measurement.