

Determination of fluorine in wastewater

 Seat №.: **AQF_WA_005E** Category : Waste

 Instruments: **AQF-100**

Method : Combustion-ion chromatography

Related standard

It is critically important to know the halogen content of waste oil out of consideration to the environment. 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.

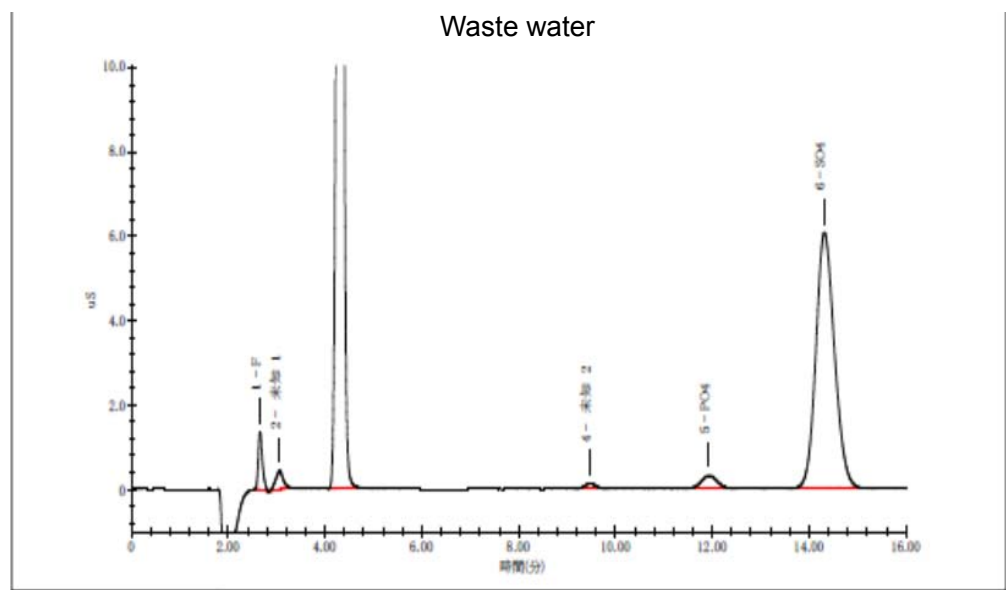
Sample name	Wastewater								
Sample status									
Measuring items	Fluorine (F)								
Measurement principle	Sample is thermally decomposed in argon (Ar) atmosphere, then combusted in oxygen (O ₂) atmosphere. Halogens in the sample are converted to hydrogen halide and halogen gas and sulfur turns 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). Analyzing flow [Sample weighing] ⇒ [Combustion] ⇒ [Collection of combustion gas] ⇒ [IC analysis]								
Parameters	<p>1. AQF-100</p> Sample size : 100ul Sample boat : Quartz sample boat, TX2SBT Additive : Not used Pyrolysis tube : Quartz tube filled with quartz wool Absorbent : Hydrogen peroxide / water Mode :								
	Heater Temp. Inlet : 900degC Outlet : 1000degC Gas flow Ar : 200 ml/min O ₂ : 400 ml/min								
	GA-100 Absorbent volume : 5 ml Sampling loop : 100 ul Absorption tube : For 10 ml Water supply : 1 Ar flow for water supply : 150 ml/min								
	ABC-100/ASC-120S								
		1st	2nd	3rd	4th	5th	End	Cool	
Position	(mm)	100	115	130					
Time	(sec)	120	120	120			100	60	
Speed	(mm/sec)	10	10	10			10	20	
		Ar Time 0 (sec)						O ₂ Time 600(sec)	

2. Ion chromatograph

Ion chromatograph : DIONEX DX-120
 Column : DIONEX Ion Pack AG12A / Ion Pack AS12A
 Eluent : 2.7mM Na₂CO₃ / 0.3mM NaHCO₃
 Eluent flow : 1.50ml / min
 Detector : Conductivity
 Suppressor : SRS
 Measuring time : 15min
 Sampling loop : 100 ul using GA-100 sampling loop
 Calibration : F Cl Br S : 0.1ppm to 5.0ppm

Results

Chromatogram



Results

Sample	F (ppm)	Recovery (%)
NaBF ₄ / Water	100	99.2
NaF / Water	100	99.1
Sample	F (ppm)	Average (ppm)
Sample A	10.1, 10.3	10
Sample B	5.8, 6.3	6

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.