Application Sheet | MITSUBISHI CHEMICAL ANALYTECH

Determination of fluorine in fluororesin

Seat №.:	**AQF_PT_003E**	Category： Plastics
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	Fluororesin
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] $\Rightarrow$ [Combustion] $\Rightarrow$ [Collection of combustion gas] $\Rightarrow$ [IC analysis]
Parameters	**1. AQF-100**

1. AQF-100

Sample size：	2mg
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：	20ml	
Sampling loop：	20 ul	
Absorption tube：	For 20 ml	
Water supply：	2	
Ar flow for water supply：	150 ml/min	

ABC-100/ASC-120S

		1st	2nd	3rd	4th	5th	End	Cool
Position	(mm)	130	140	150				
Time	(sec)	100	120	180			120	30
Speed	(mm/sec)	10	10	10				

Ar Time 0 (sec) O₂ Time 600(sec)

2. Ion chromatograph

Ion chromatograph	: DIONEX DX-120
Column	: DIONEX Ion Pack AG12A / Ion Pack AS12A
Eluent	: 2.7mM Na_2CO_3 / 0.3mM $NaHCO_3$
Eluent flow	: 1.50ml / min
Detector	: Conductivity
Suppressor	: ASRS-300　4-mm
Measuring time	: 15min
Sampling loop	: 20 ul using GA-100 sampling loop
Calibration	: F Cl Br S　: 5ppm to 40ppm

Results

Chromatogram
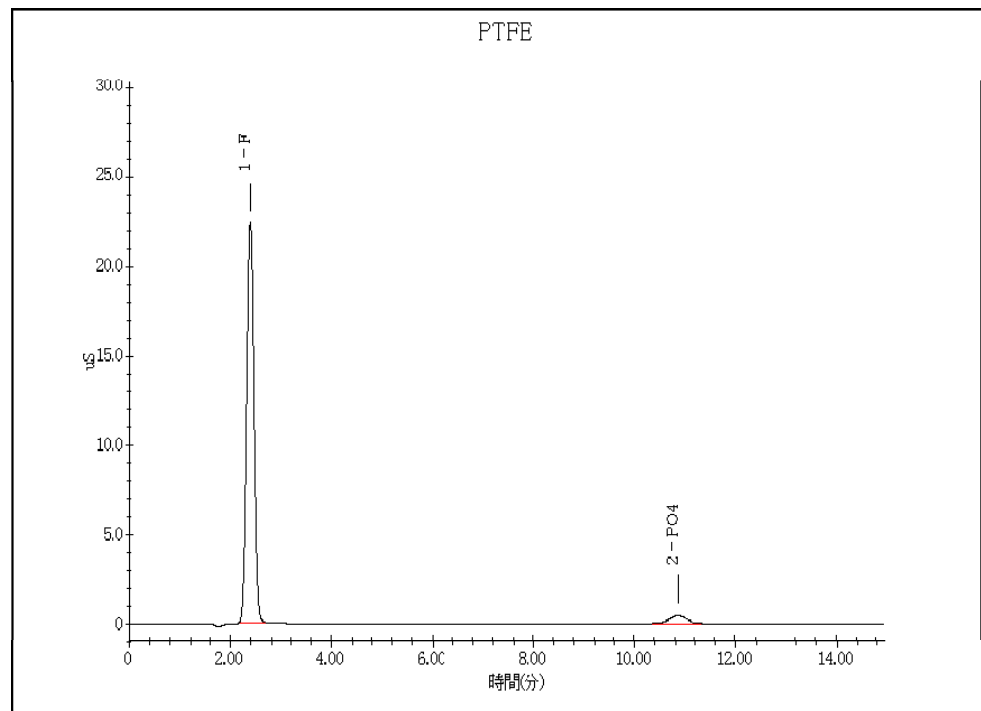
Results

Sample	Calculated value (%)	F (%)	Average (%)	RSD(%)
PTFE	76	76.5, 75.7, 76.3	76.2	0.50
ETFE	approx. 60	60.3, 60.2, 61.1	60.5	0.85

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.

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