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Application Sheet

Determination of fluorine in lubricating oil —— 1/2

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.

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Sample name	Lubricating oil
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	**1. AQF-100** 　　　　　　　　Sample size : 50mg 　　　　　　　　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 : 800degC 　　　　　　　　Outlet : 1000degC 　　　　　　　　Gas flow Ar : 200 ml/min 　　　　　　　　O_2 : 400 ml/min GA-100　　　Absorbent volume : 5ml 　　　　　　　Sampling loop : 20 µl 　　　　　　　Absorption tube : For 10 ml 　　　　　　　Water supply : 2 　　　Ar flow for water supply : 150 ml/min

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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   : SRS
Measuring time   : 15min
Sampling loop   : 100 µl using GA-100 sampling loop
Calibration   : F Cl Br S :0.1ppm to 5.0ppm

Results

Chromatogram

Time (minutes)
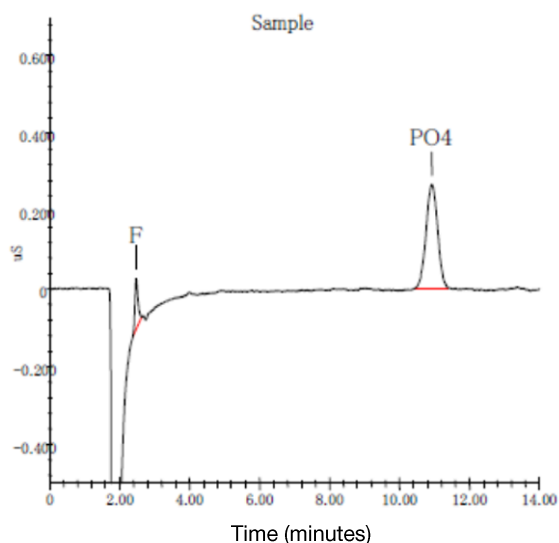
Results

Sample	Result (ppm)	Average (ppm)
Sample A	2.5 , 2.7	2.6
Sample B	10.5 , 10.3	10.4

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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