

Sheet No.

AQF PE 002E Oil

Determination of sulfur in fuel 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.

Sample name	Fuel oil (Regular gasoline)																																											
Sample status																																												
Measuring items	Sulfur (S)																																											
Measurement principle	<p>Sample is thermally decomposed in argon (Ar) atmosphere, then combusted in oxygen (O₂) 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>Analyzing flow [Sample weighing]→[Combustion]→[Collection of combustion gas]→[IC analysis]</p>																																											
Parameters	<p>1. AQF-100</p> <p style="padding-left: 40px;">Sample size : 50ul Sample boat : Quartz sample boat, TX2SBT Additive : Not used Pyrolysis tube : Quartz tube filled with quartz wool Absorbent : Hydrogen peroxide / water, 30ppm</p> <p style="padding-left: 40px;">Heater Temp. Inlet : 800degC Outlet : 1000degC Gas flow Ar : 200 ml/min O₂ : 400 ml/min</p> <p>GA-100 Absorbent volume : 5 ml Sampling loop : 100 μl Absorption tube : For 10 ml Water supply : 1 Ar flow for water supply : 150 ml/min</p> <p>ABC-100</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th></th> <th>1st</th> <th>2nd</th> <th>3rd</th> <th>4th</th> <th>5th</th> <th>End</th> <th>Cool</th> </tr> </thead> <tbody> <tr> <td>Position</td> <td>(mm)</td> <td>95</td> <td>110</td> <td>180</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Time</td> <td>(sec)</td> <td>120</td> <td>30</td> <td>0</td> <td></td> <td></td> <td>60</td> <td>30</td> </tr> <tr> <td>Speed</td> <td>(mm/sec)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p style="text-align: right;">Ar Time 0 (sec) O₂ Time 600(sec)</p>										1st	2nd	3rd	4th	5th	End	Cool	Position	(mm)	95	110	180					Time	(sec)	120	30	0			60	30	Speed	(mm/sec)							
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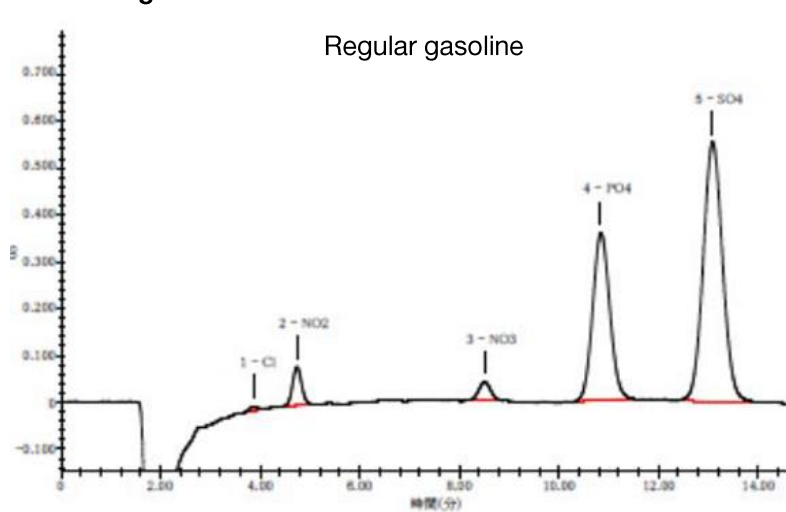
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2. Ion chromatograph

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

Results

Chromatogram



Results

The measurement values coincided with the results obtained by other methods. Chloride and sulfur at ppm level can be analyzed simultaneously.

Sample	Results (ppm)	Average(ppm)	TS-100 (ppm)
Kerosene	53.8, 54.8	54.3	54.2
Regular Gasoline	47.6, 45.3	46.5	46.2
High-octane Gasoline	7.05, 7.55	7.3	7.4

TS-100:Sulfur Analyzer based on UV-FL Method

Remarks

*Handling of reagents: Confirm labels and safety data sheets of reagents and handle them with enough care.

*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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