

## Determination of chlorine in waste oil

Seat №.: **AQF\_RE\_001E** 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.

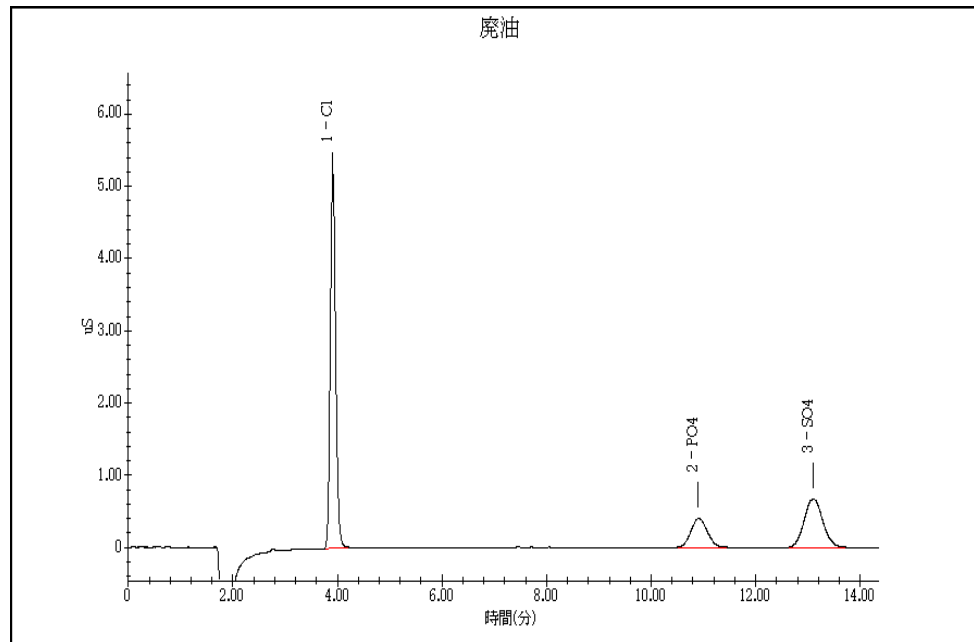
Sample name	Waste oil																																				
Sample status																																					
Measuring items	Chloride (Cl)																																				
Measurement principle	<p>Sample is thermally decomposed in argon (Ar) atmosphere, then combusted in oxygen (O<sub>2</sub>) atmosphere. 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>1. AQF-100</b></p> <p>Sample size : 20ul diluted by toluene          Sample boat : Quartz sample boat, TX2SBT          Additive : Not used          Pyrolysis tube : Quartz tube filled with quartz wool          Absorbent : Hydrogen peroxide / water</p> <p>Heater Temp. Inlet : 800degC          Outlet : 1000degC          Gas flow Ar : 200 ml/min          O<sub>2</sub> : 400 ml/min</p> <p>GA-100 Absorbent volume : 10ml          Sampling loop : 100μl          Absorption tube : For 10ml          Water supply : 1          Ar flow for water supply : 150 ml/min</p> <p>ABC-100</p> <table border="1"> <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>100</td> <td>150</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>30</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) O<sub>2</sub> Time 600(sec)</p>			1st	2nd	3rd	4th	5th	End	Cool	Position	(mm)	100	150	180					Time	(sec)	120	30	30			60	30	Speed	(mm/sec)							
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**2. Ion chromatograph**

Ion chromatograph : DIONEX DX-120  
 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 : SRS  
 Measuring time : 15min  
 Sampling loop : 100 μl using GA-100 sampling loop  
 Calibration : F Cl Br S : 5ppm to 40ppm

Results

**Chromatogram**



**Results**

TOX : Data on Cl Analyzer based on coulometry

Sample	Cl (%)	Average	TOX(%)
Sample1	5.1, 4.9	5.0	5.3
Sample2	0.9, 0.9	0.9	1.0

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.