# Sheet

## Application MITSUBISHI CHEMICAL ANALYTECH

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### **Determination of chlorine in waste oil**

Waste Seat №.: AQF\_RE\_001E

**AQF-100** Instruments:

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.

Measuring items         Chloride (CI)           Measurement principle         Sample is thermally decomposed in argon (Ar) atmosphere, then combusted oxygen (O₂) atmosphere. Halogens in the sample are converted to hydrog halide and halogen gas and sulfur turns into sulfur oxide. These components a collected into absorbing solution and converted to halide ion and sulfate ion. T 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 : 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           Heater Temp. Inlet : 800degC Outlet : 1000degC Gas flow Ar : 200 ml/min O₂ : 400 ml/min           GA-100 Absorbent volume : Sampling loop : 100µl Absorption tube : For 10ml Water supply : 1           Ar flow for water supply : 1         150 ml/min           ABC-100 ABC-100 Index (Sample in the supply : 150 ml/min)         150 ml/min	Sample name	Waste oil									
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Sample weighing  ⇒ [Combustion] ⇒ [Collection of combustion gas] ⇒ [IC analysis]    Parameters   1. AQF-100	principle	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).									
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Absorption tube : For 10ml		volume :									
Water supply: 1 Ar flow for water supply: 150 ml/min  ABC-100    1st   2nd   3rd   4th   5th   End   Cool											
Ar flow for water supply: 150 ml/min  ABC-100											
Position         (mm)         100         150         180           Time         (sec)         120         30         30         60         30											
Position         (mm)         100         150         180           Time         (sec)         120         30         30         60         30		ADO 400									
Position         (mm)         100         150         180		ABC-100	l	1et	2nd	3rd	4th	5th	End	Cool	
Time (sec) 120 30 30 60 30		Position	(mm)				701	Jui	Liiu	C001	
			, ,						60	30	
Speed (mm/sec)		Speed	` '	1.23							

Ar Time 0 (sec)

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#### 2.lon 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>

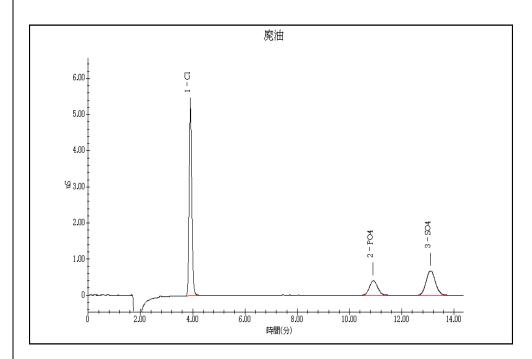
Eluent flow : 1.50ml / min Detector : Conductivity

Suppressor : SRS Measuring time : 15min

Sampling loop : 100  $\mu$ l using GA-100 sampling loop Calibration : F Cl Br S : 5ppm to 40ppm

#### Results

#### **Chromatogram**



#### Results

TOX: Data on CI Analyzer based on coulometry

Sample	CI (%)	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.

AQF-100\_02\_001

<sup>\*</sup> 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.