

Sheet No.

AQF EM 011E Materials

# Determination of chlorine, bromine and sulfur in solder materials

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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	Solder paste
Sample status	
Measuring items	Chlorine (Cl), Bromine (Br), Sulfur (S)
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 : 50 to 100mg          Sample boat : Ceramic sample boat, SXSMBS          Additive : WO<sub>3</sub>          Pyrolysis tube : Quartz tube filled with quartz wool          Absorbent : 300ppm Hydrogen peroxide / water          Mode:</p> <p>Heater Temp. Inlet : 900degC          Outlet : 1000degC          Gas flow Ar : 200ml/min          O<sub>2</sub> : 400ml/min</p> <p>GA-100 Absorbent volume : 10ml          Sampling loop : 100ul          Absorption tube : For10ml          Water supply : 2          Ar flow for water supply : 100ml/min</p>

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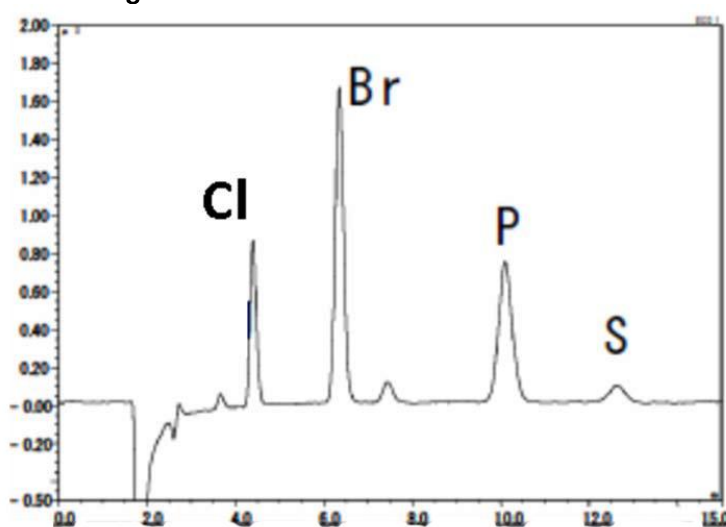
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## 2. Ion chromatograph

Ion chromatograph : DIONEX ICS-1500  
 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 : ASRS-4-mm  
 Measuring time : 15min  
 Sampling loop : 100 ul using GA-100 sampling loop  
 Calibration : F Cl Br S :0.1ppm to 10ppm

Results

### Chromatogram



### Results

Sample	( ppm )		
	Cl	Br	S
Solder paste	5.03	36.3	8.11

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, TX3SCY.

\*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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