

Sheet No.

AQF FO 027E Foods

Determination of chlorine in regular and low-salt soy sauce

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Instruments : AQF-2100H System, HF-210, GA-210, ABC-210/ASC240S

Method : Combustion-ion chromatography

Related standard :

It is important to know the Chlorine content in the samples as component analysis for checking its quality. 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-2100H which safely combusts samples with an ion chromatograph.

Sample name	Regular and low-salt soy sauce
Sample status	
Measuring items	Chlorine (Cl)
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	<p>1. AQF-2100H</p> <p>Sample size : 10mg to 20mg Sample boat : Ceramic sample boat, SXSMBS Additive : WO₃ 100mg Pyrolysis tube : Quartz tube filled with quartz wool Absorbent : Hydrogen peroxide / water</p> <p>HF-210 Heater Temp. Inlet : 1000degC Outlet : 1100degC Gas flow Ar : 200 ml/min O₂ : 400 ml/min</p> <p>GA-210 Absorbent volume : 10 to 20ml Sampling loop : 20 ul Absorption tube : For 10 ml Water supply : 4 Ar flow for water supply : 100 ml/min</p>

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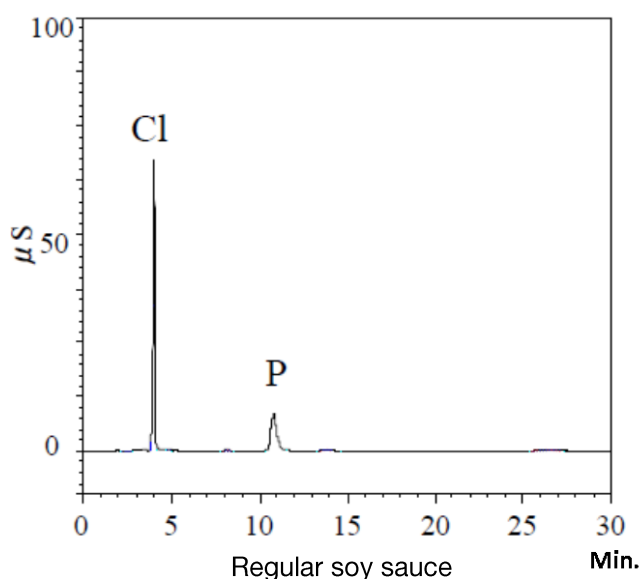
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2. Ion chromatograph

Ion chromatograph : DIONEX ICS-1500
 Column : DIONEX Ion Pack AG12A / Ion Pack AS12A
 Eluent : 2.7mM Na₂CO₃ / 0.3mM NaHCO₃
 Eluent flow : 1.50ml / min
 Detector : Conductivity
 Suppressor : ASRS-4-mm
 Measuring time : 30min
 Sampling loop : 20 ul using GA-210 sampling loop
 Calibration : F Cl Br S :5ppm to 40ppm

Results

Chromatogram



Results

Sample (mg)	Sample (mg)	Cl (%)
Low-salt soy sauce	10	4.3
Regular soy sauce	20	10.5

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-240S.
 When ASC-240S 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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