Sheet No.
AQF PP 030E Wood

Determination of chlorine and sulfur in wood chips 1/2

Instruments : AQF-2100H System,HF-210,GA-210,ABC-210 / ASC-240S
Method : Combustion-ion chromatography
Related standard :

Wood chips are a raw material for paper. They are also contained in most of wastes. As impurities when wood chips are used as a raw material for paper, and as wastes containing wood chips, it is critically important to know the halogen content 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-2100H which safely combusts samples with an ion chromatograph.

Sample name	Wood chips
Sample status	Crushed pieces
Measuring items	Chlorine (Cl) , Sulfur (S)
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	**1. AQF-2100H** Sample size : 40 to 50mg Sample boat : Ceramic sample boat, SXSMBS Additive : WO_3 100 to 300mg Pyrolysis tube : Quartz tube filled with quartz wool Absorbent : 90ppm Hydrogen peroxide / water Mode : Constant volume mode HF-210 Heater Temp. Inlet : 1000degC Outlet : 1100degC Gas flow Ar : 200 ml/min O_2 : 400 ml/min GA-210 Absorbent volume : 5 ml Sampling loop : 100 ul Absorption tube : For 10 ml Water supply : 2 Ar flow for water supply : 100 ml/min ABC-210/ASC-240S

		1st	2nd	3rd	4th	5th	End	Cool
Position	(mm)	110	150	180				
Time	(sec)	30	30	30			600	60
Speed	(mm/sec)	10	10	10			5	40

Ar Time 0 (sec) O_2 Time 600(sec)

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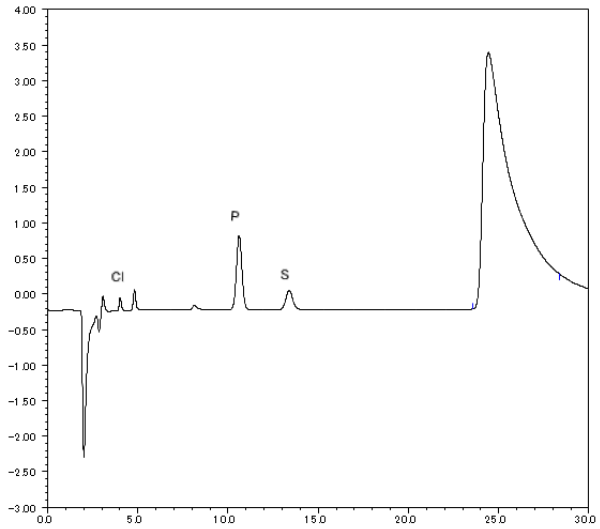
2. Ion chromatograph

Ion chromatograph	: DIONEX ICS-1500
Column	: DIONEX Ion Pack AG12A / Ion Pack AS12A
Eluent	: 2.7mM Na_2CO_3 / 0.3mM $NaHCO_3$
Eluent flow	: 1.50ml / min
Detector	: Conductivity
Suppressor	: ASRS-4-mm
Measuring time	: 15min
Sampling loop	: 100 µl using GA-210 sampling loop
Calibration :F Cl Br S	: 0.1ppm to 5.0ppm

Results

Chromatogram



Results

	Cl(ppm)	S(ppm)
n=1	92.0	106
2	93.0	102
Average	92.5	104

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.