

Sheet No. **AQF2100 IM 048** Inorganic Materials

Determination of fluorine in metal fluorides by combustion ion chromatography

Instruments : AQF-2100H system

Detection method : Ion chromatography

Related standard :

Introduction

Concentrations of fluorine (F), chlorine (Cl), bromine (Br), iodine (I), and sulfur (S) can be determined accurately by combustion ion chromatography (CIC), a system in which samples are safely combusted by Automatic Quick Furnace (model AQF-2100H) and injected online to an ion chromatograph (IC).

Method

- Combustion ion chromatography

Sample was pyrolysed in argon (Ar) carrier gas, then pyrolysis gas was combusted in oxygen (O₂) gas. Halogens in the sample were converted into hydrogen halide (HX) and/or halogen gas (X₂), and sulfur in the sample was converted into sulfur oxide (SO_x), which were collected and further converted into halide ion (X⁻) and/or sulfate ion (SO₄²⁻) in the absorbent. This absorbent was injected to IC, and analyzed.

Flowchart

Weighing ⇒ combustion ⇒ collection ⇒ IC

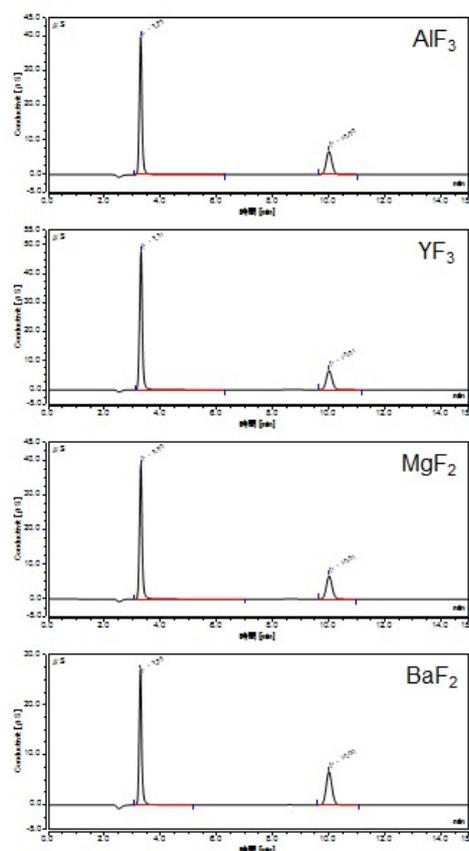
Samples

- Metal fluorides
 - Aluminum fluoride (AlF₃), Yttrium fluoride (YF₃),
 - Magnesium fluoride (MgF₂), Barium fluoride (BaF₂)

Results

Name	Size (mg)	WO ₃ (mg)	F (%)
AlF₃			
1	1.24	-	56.9
2	1.30	-	56.9
Average			56.9
Theoretical value			67.9
Recovery			83.8%
YF₃			
1	2.35	-	37.3
2	2.19	-	37.9
Average			37.6
Theoretical value			39.1
Recovery			96.3%
MgF₂			
1	1.18	32.8	59.9
2	1.17	34.9	58.6
Average			59.3
Theoretical value			61.0
Recovery			97.2%
BaF₂			
1	2.19	35.0	21.0
2	2.20	32.4	21.2
Average			21.1
Theoretical value			21.7
Recovery			97.2%

- Chromatogram



*This sheet is provided as a reference and does not guarantee analytical values. Optimal conditions may vary depending on external factors, such as the analysis environment, and the nature of the sample.