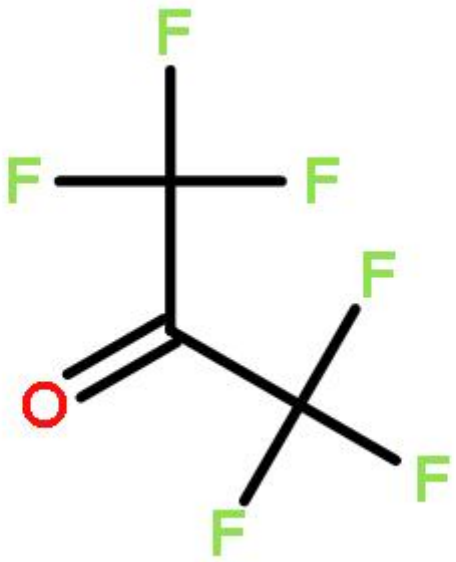

Detection of fluoride in hexafluoroacetone

Introduction:

Hexafluoroacetone is an organic compound, mainly used as an organic solvent. It can be copolymerized with cyclohexane to obtain high-temperature and corrosion-resistant coatings and adhesives. It is also a raw material for synthesizing pharmaceuticals, pesticides, polymer materials, and organic chemicals.

Detection items (Table 1):

Anion	F^-

Keywords: Hexafluoroacetone, Ion chromatography, Fluoride

Instruments and equipment

- **Ion chromatograph**: CIC-D120$^+$
- **Ultra pure water machine**:ECO-S15

Qingdao Shenghan Chromatograph Technology Co., Ltd

Requirements

Reagents

Unless otherwise specified, all reagents used are superior grade. Br^- anions standard solution (1000 mg/L)

Deionized Water

When preparing standard samples manually or diluting real samples, please use ASTM filtration and deionization requirements that meet the specifications listed in the table 2.

Table 2: Deionized water specification.

Specification	
Ions Resistivity	≥18.25MΩ·cm
Organics-TOC	<10ppb
Iron/Transition Metals	<1ppb
Pyrogens	<0.03Eu/mL
Particulates（>0.2μm）	<1unit/mL
Colloids-Silica	<10ppb
Bacteria	<1cfu/mL

Chromatography conditions (Anions):

Table 3: Anions analysis conditions

Instrument	CIC-D120⁺
Eluent	0-6 min，13 mM KOH 6-20 min，50 mM KOH 20-25 min，13 mM KOH
Flow rate	0.7 mL/min
Injection volume	25 μL
Analytical Column	SH-AP-1
Column oven temperature	35℃
Conductivity cell temperature	35℃
Suppressor current	90 mA

Sample preparation

Weigh 1.5665 g of sample into a 100 mL volumetric flask, dilute with pure water to the mark, and perform machine testing. And conduct a blank water control experiment.

Standard chromatogram

Standard chromatogram, As shown in below:

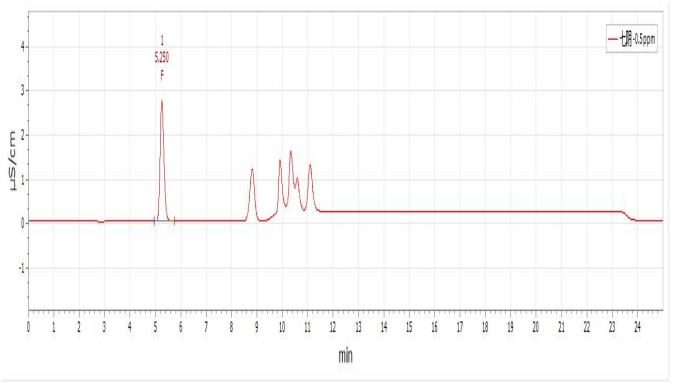

Figure 1. Chromatogram of standard sample.

Blank chromatogram

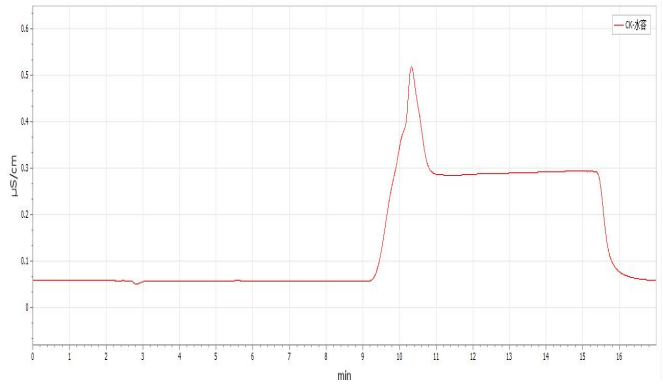

Figure 2. Chromatogram of blank

Sample chromatogram

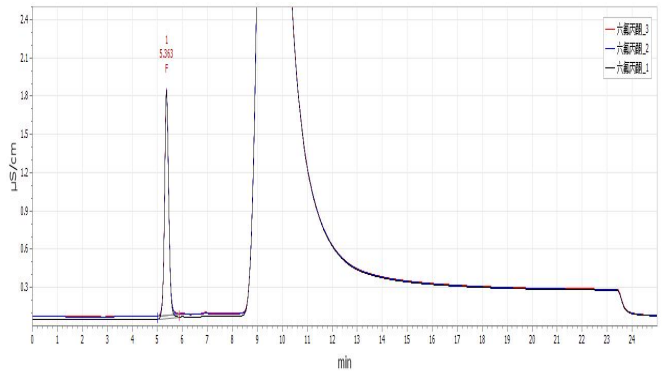

Figure 3. Chromatogram of sample 1#

Results and calculations

Table 4: Sample test result

Sample	F^-（mg/kg）
1#	229.73

Remarks: ① The measured value has been deducted from the blank value; ② There may be differences in testing results between different methods and laboratories.

Risk reminder: Some components in the sample, such as metal ions, organic compounds, etc., may have a certain impact on the lifespan of chromatograph columns, suppressors, and other components. Please be aware.

Feasibility analysis and conclusion

The above experiments prove that the detection method has good resolution and is suitable for the determination of the content of the components to be measured in the sample.