



Detection of fluoride in disposable paper cups

Introduction:

Disposable paper cups are widely used in daily life, and there is a layer of plastic film hidden inside the cup. When poured into hot water, it will degrade some chemicals. Although it brings convenience, there are also some potential health hazards.

Fluoride: It can be beneficial to teeth as it helps prevent cavities, but at high concentrations, fluoride is harmful to the human body. Excessive intake of fluoride can lead to fluorosis, including dental and skeletal disorders, as well as neurological problems.



Detection items (Table 1):

Anion	Fluoride
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Keywords: Fluoride, Ion chromatography, Disposable paper cup.

Instruments and equipment

- **Ion chromatograph:** SH-CIC3200
 - **Ultra pure water machine:** ECO-S15
- Qingdao Shenghan Chromatograph Technology Co., Ltd

Requirements

Reagents

Unless otherwise specified, all reagents used are superior grade. Fluoride 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	SH-CIC3200
Eluent	15 mM KOH
Flow rate	1.0 mL/min
Injection volume	25 μL
Analytical Column	SH-AC-23
Column oven temperature	35°C
Conductivity cell temperature	35°C
Suppressor current	45 mA

Sample preparation

Weigh the sample (accurately record the mass, accurate to 0.0001 g) and place it in the sample boat for high-temperature hydrolysis ion chromatography analysis (solid sample analysis step). Simultaneously conduct analysis on the control group of sample boat air burning.

Standard chromatogram

More information, Please visit our website:
<http://www.sheng-han.net/>
 Serial number:056

Standard chromatogram, As shown in below:

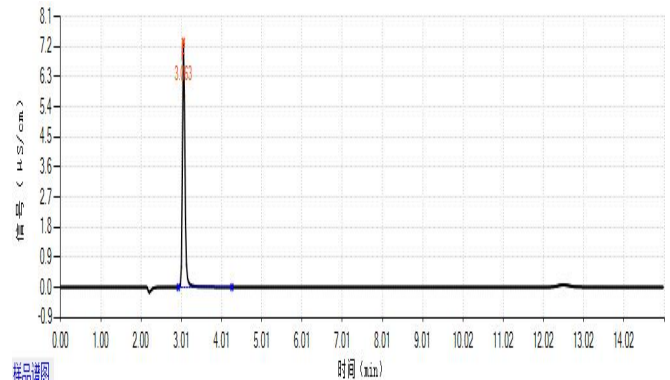


Figure 1. Chromatogram of standard sample.

Sample chromatogram

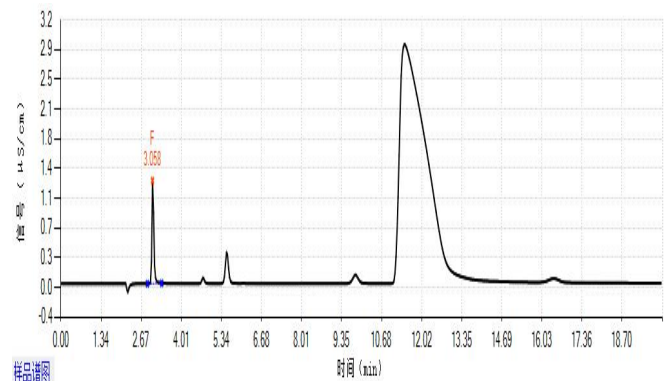


Figure 2. Chromatogram of sample 1#

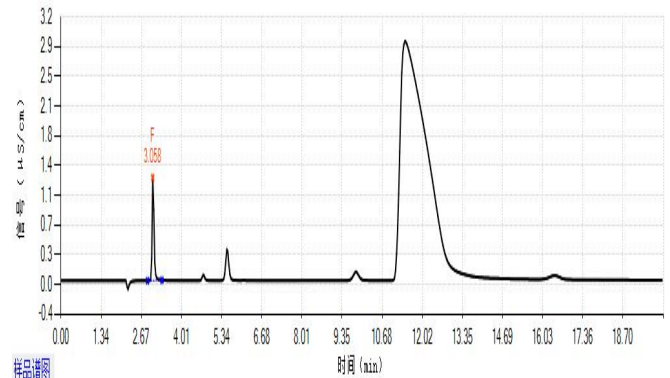


Figure 3. Chromatogram of sample 2#

Results and calculations

Table 4: Sample test result

Sample	Fluoride (mg/kg)
1#	166.99
2#	156.88

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.

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.