



Detection of chloride in rubber

Introduction:

Rubber is a commonly used material that can be used in many aspects such as tires, pipeline seals, etc. There are chlorinated and non chlorinated rubbers on the market, and some rubbers are sensitive to chloride ions. When chloride ions come into contact with them, they can cause the rubber to lose elasticity, harden or age, and even crack.

Table 1: Detection items

Anions	Chloride
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Keywords: Rubber, chloride, ion chromatograph.

Instruments and equipment

- **Ion chromatograph:** CIC-D160+
- **Ultra pure water machine:**EU-20

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Requirements

Reagents

Unless otherwise specified, all reagents used are superior grade. Commercially available certified standard solution for chloride (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

Table 3: Analysis conditions

Instrument	CIC-D160 ⁺
Eluent	15mM KOH
Flow rate	0.7 mL/min
Injection volume	25 μL
Analytical column	SH-AP-1
Column oven temperature	35°C
Conductivity detector temperature	35°C
Suppressor current	45mA

Sample preparation

Weigh approximately 0.1 g (accurate to 0.0001 g) of the sample for oxygen bomb combustion, dilute the absorption solution to 100 mL, shake well, and pass through a 0.22μm disposable needle filter for ion chromatography testing. Simultaneously conducting blank control experiments.

Standard chromatogram

Standard chromatogram, As shown in below:

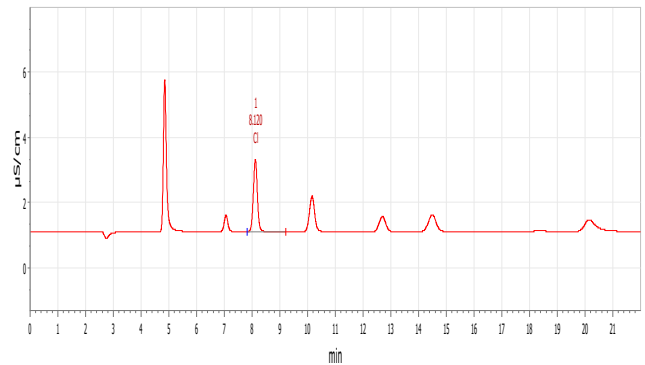


Figure 1. Chromatogram of standard (Cl⁻ 1mg/L).

Blank chromatogram

Blank chromatogram, As shown in below:

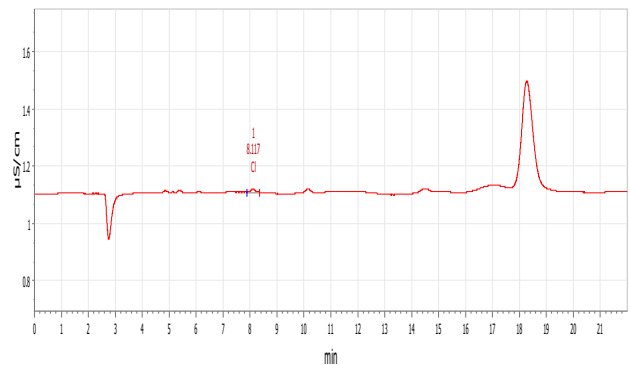


Figure 2. Chromatogram of blank.

Sample chromatogram

Sample chromatogram, As shown in below:

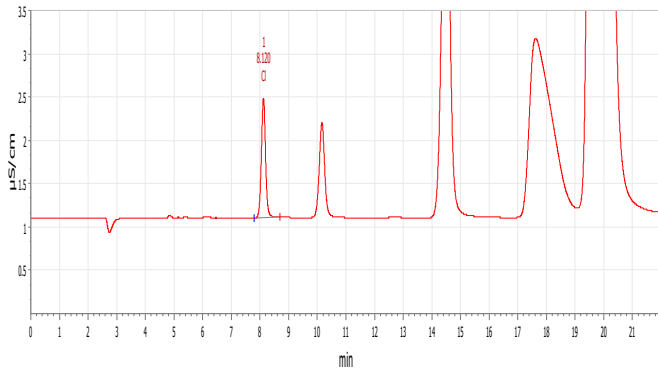


Figure 3. Chromatogram of sample.

Results and calculations

Table 4: Sample test result (Unit: mg/kg)

Sample	Cl ⁻
1#	124.1

Remarks: ① The test result has deducted the blank space; ② There may be differences in test 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.