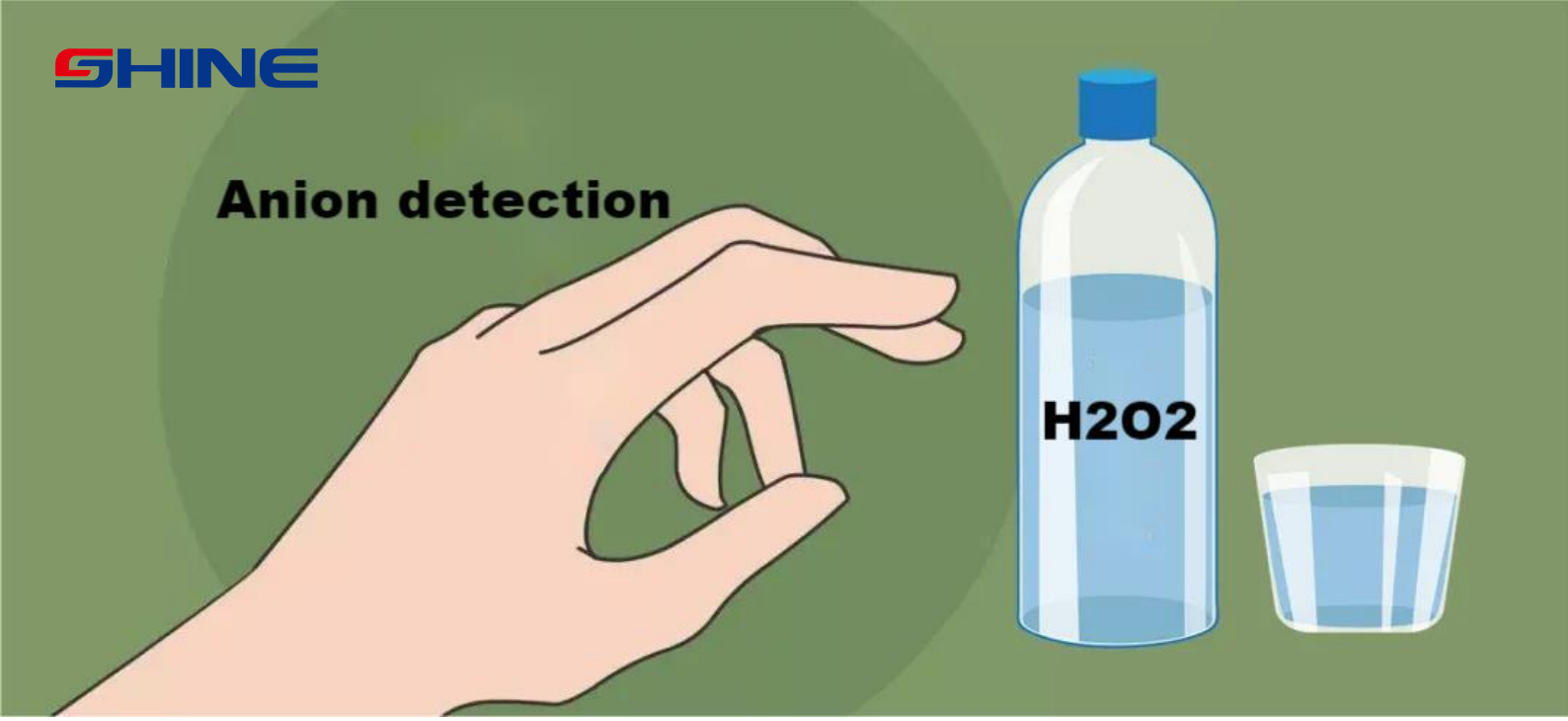

Detection of anions in hydrogen peroxide

Introduction:

Turbidimetric and colorimetric methods are often used for the determination of inorganic anions in hydrogen peroxide, but this method can only determine a single inorganic anion and takes a long time. At the same time, due to low sensitivity, trace anions cannot be determined. The use of ion chromatography can accurately determine trace anions in sample solutions.

Detection items (Table 1):

Anion	Cl^-	SO_4^{2-}	NO_3^-	PO_4^{3-}

Keywords: Ion chromatography, Hydrogen peroxide, Anions

Instruments and equipment

- **Ion chromatograph**: CIC-D300$^+$
- **Autosampler**: SHAD-1
- **Ultra pure water machine**:ECO-S15

Qingdao Shenghan Chromatograph Technology Co., Ltd

Requirements

Reagents

Unless otherwise specified, all reagents used are superior grade.Cl^-,SO_4^{2-},NO_3^-,PO_4^{3-} 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:

Table 3:

Instrument	CIC-D300⁺
Eluent	0-15 min 20 mM KOH 15-40 min 20-55 mM KOH 40.1-50 min 20 mM KOH
Flow rate	1.0 mL/min
Injection volume	1000 μL
Analytical Column	AG15 + AS15
Column oven temperature	30℃
Conductivity cell temperature	35℃
Suppressor current	130 mA

Sample preparation

After using a 0.22um disposable filter, the sample is placed in an autosampler for analysis.

Standard chromatogram

Standard chromatogram, As shown in below:

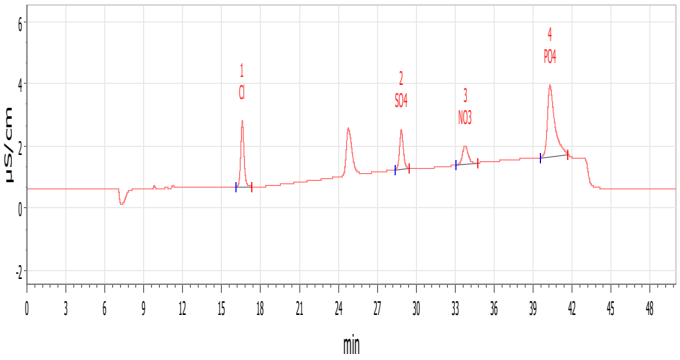

Figure 1. Chromatogram of standard sample.

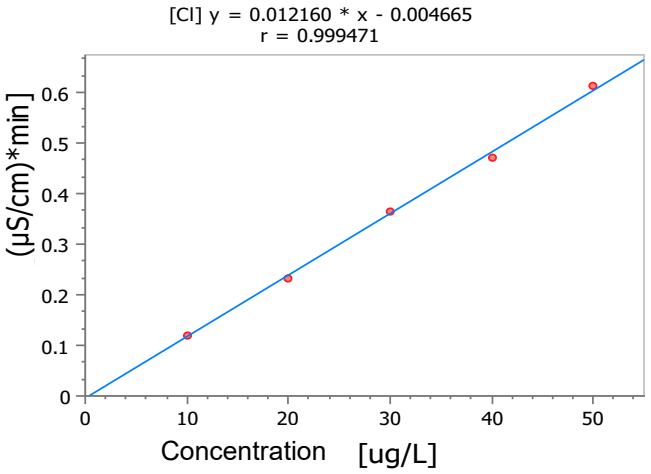

Figure 2. Graph of chloride linear

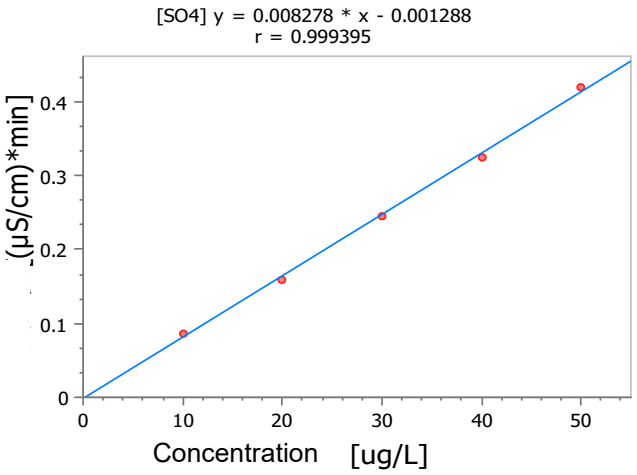

Figure 3. Graph of sulfate linear

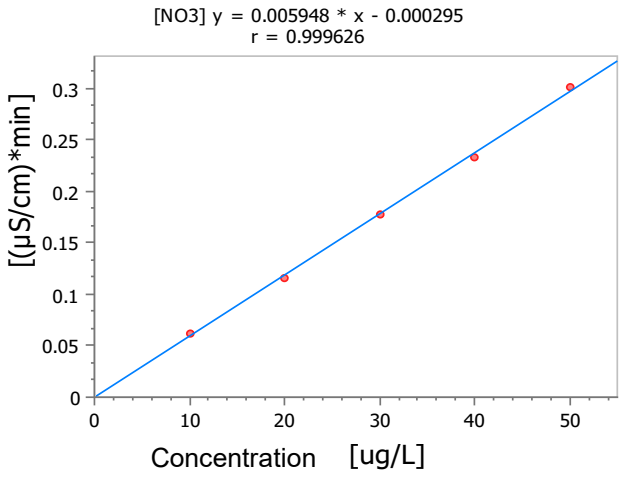

Figure 4. Graph of nitrate linear

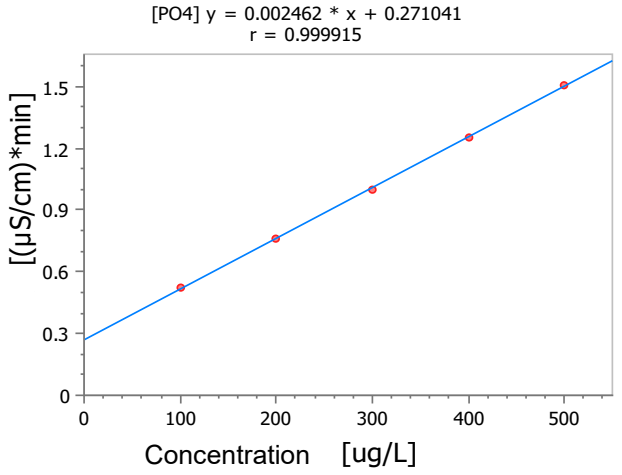

Figure 5. Graph of phosphate linear

Sample chromatogram

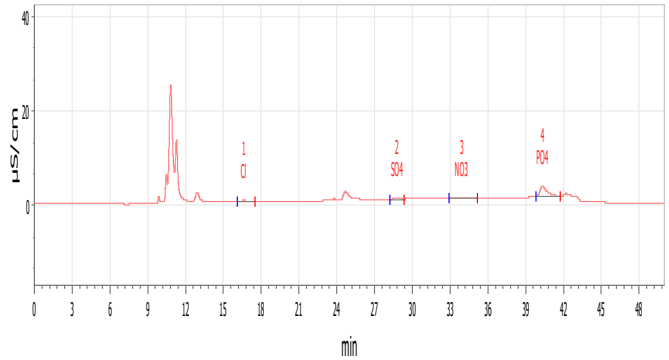

Figure 6. Chromatogram of sample 1#

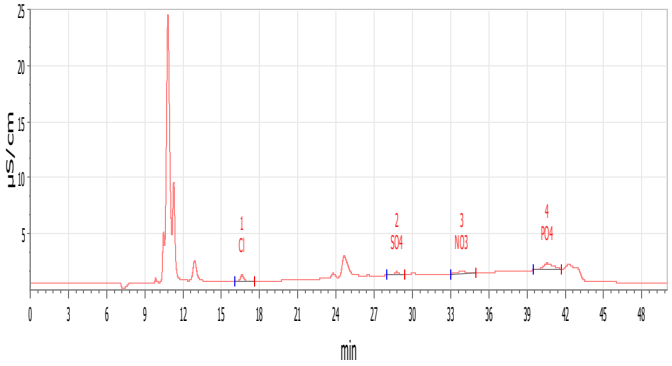

Figure 7. Chromatogram of sample 2#

Results and calculations

Table 4: Sample test result

Sample	Content（μg/L）			
	Cl^-	SO_4^{2-}	NO_3^-	PO_4^{3-}
Sample 1#	11.963	15.511	16.721	507.385
Sample 2#	15.706	13.373	22.101	95.033

Remarks: ① ND indicates not detected or below the detection limit; ② The measured value has been deducted from the blank value; ③ There may be differences in detection results between different methods and different 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.