



Determination of nitrite in metronidazole sodium chloride injection

Introduction:

Metronidazole sodium chloride injection is a kind of preparation used to treat anaerobic infection, almost colorless and transparent. The active ingredient is metronidazole, and the auxiliary materials are sodium chloride and water for injection. Metronidazole is a nitroimidazole derivative, which is prone to appear the degradation product nitrite after sterilization. Nitrite can oxidize the normal oxygen carrying low iron hemoglobin in the blood into methemoglobin, which will lose its oxygen carrying capacity and cause tissue hypoxia. If the human body ingests too much nitrite in a short time, it may cause poisoning, and in serious cases, it may also lead to cell canceration. Therefore, it is necessary to determine the nitrite content in metronidazole sodium chloride injection.

Detection items (Table 1):

Anion	NO ₂ ⁻
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Keywords: Azide,Irbesartan,Ion chromatograph

Instruments and equipment

- **Ion chromatograph:** CIC-D120
- **Eluent generator:** SHRF-10
Qingdao Shenghan Chromatography Technology Co., Ltd
- **Ultra pure water machine:** UPT-I-20L
Sichuan youpu Chaochun Technology Co., Ltd



Requirements

Reagents

All reagents used are superior grade pure or better,Purchase certified standard solutions NO₂⁻ (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

Sample preparation

1. Reference solution: Accurately weigh 0.6030 g of sodium nitrite into a 100 mL volumetric flask, dissolve it in high-purity water, dilute it to volume and shake it up. It is the reference stock solution. Take 1 mL of the above stock solution into a 100 mL volumetric flask, dilute it with high-purity water to the scale, shake it up to obtain the reference solution for use, and enter the ion chromatography system for determination.

2. System suitability solution: Accurately weigh 0.9148 g of sodium chloride into a 100 mL volumetric flask, dissolve it in high-purity water, add 1 mL of reference stock solution, dilute the high-purity water to volume, shake up to obtain system suitability solution, and enter the ion chromatography system for determination.

3. Test solution: Take metronidazole sodium chloride injection and directly enter the ion chromatography system for determination.

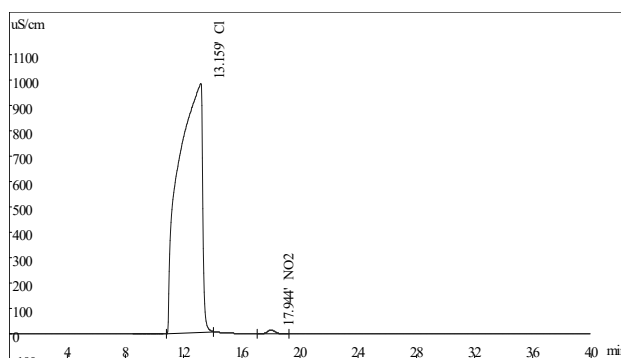


Figure 1. Chromatogram of System suitability

Comparison testing (Anion blank)

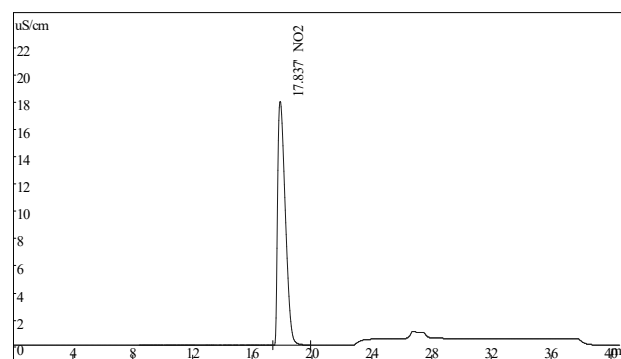


Figure 2. Chromatogram of blank.

Chromatographic conditions (Table 3):

Eluent	0-20 min, 5 mM KOH 20.1-35 min, 25 mM KOH 35.1-40 min, 5 mM KOH
Flow rate	1.0 mL/min
Injection volume	25 µL
Analytical Column	IonPac AS18
Column oven temperature	30°C
Conductivity cell temperature	30°C
Suppressor current	60 mA

Sample chromatogram

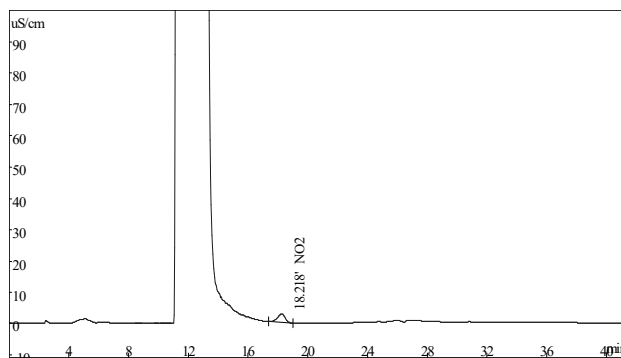


Figure 3. Chromatogram of anion in sample 1#

System suitability chromatogram

System suitability chromatogram, As shown in below:

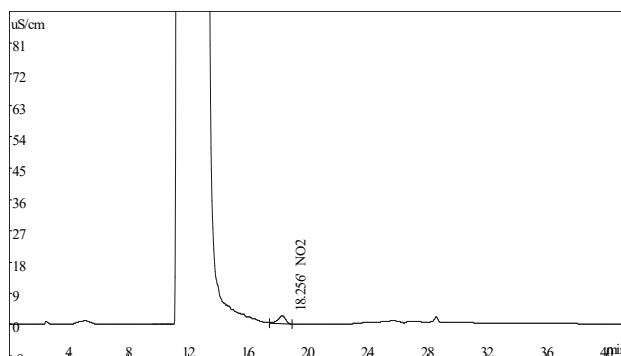


Figure 4. Chromatogram of anion in sample 2#

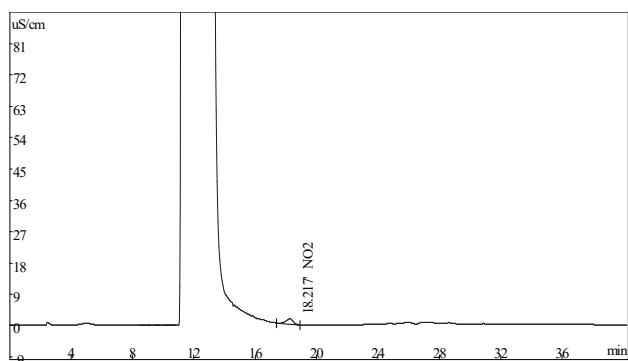


Figure 5. Chromatogram of anion in sample 3#

Results and calculations

Table 4: Sample test result

Instrument	Nitrite content (mg/L)					
	1#		2#		3#	
CIC-D120	6.205	6.109	4.846	4.825	3.153	3.207
Average value (RSD)	6.157 (1.10%)		4.836 (0.31%)		3.180 (1.20%)	

Remarks:

Remarks: This experiment is for external standard quantification, and the results are for reference only; The test results of different methods and laboratories will be different.

Precautions

It is easy to be polluted during the experiment, so the experimenter is required to operate in strict accordance with the operating procedures.

Feasibility analysis and conclusion

Through the above experiments, it is proved that the detection method has good resolution and is suitable for the determination of the content of the components to be determined in the sample.