Determination of target compounds in cefoperazone sodium and tazobactam sodium for injection by capillary electrophoresis

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Abstract: A capillary zone electrophoresis (CZE) method was developed for the simultaneous determination of cefoperazone sodium and tazobactam sodium in the injectable powder of cefoperazone sodium and tazobactam sodium with hydrochlorothiazide as the internal standard. The operation was carried out on a quartz capillary 75 cm × 75 μm i.d. 63 cm effective length. The electrophoretic conditions were as follows: 40 mmol/L borax solution as the background electrolyte, BGE, 12.0 kV applied voltage, 220 nm as the detection wavelength, the sample solution was injected by hydraulic pressure for 10 s at the height of 10 cm. The cefoperazone and tazobactam showed good linear relationship in the ranges of 0.25 – 3.96 g/L and 0.062 – 0.99 g/L with the correlation coefficients of 0.9995 and 0.9996 respectively. The relative standard deviations of relative peak areas were less than 3%. The preparation was stable in 208 min. The recovery results met the methodology requirements. The method is simple, rapid, reproducible and suitable to control the quality of cefoperazone sodium and tazobactam sodium injectable powder.

Key words: capillary electrophoresis, CZE, cefoperazone sodium, tazobactam sodium, cefoperazone sodium and tazobactam sodium for injection, compound drugs
色 谱 第
卷
结构式见图

!#
为内标,同时对
和
进行
定量测定,建立了一种简便快速、低成本的检测方法
为其质量控制提供参考。

图
、
和
的分子结构式

图

图


1

1.1

HPCE-10

KS-

Sartorius

pHS-25

CFRS TZBS

CFRS > 99.6% TZBS > 99.5% >

CFRS > 99.6% TZBS > 99.5% > 120D

081101 081102 081103

CFRS > 99.6% TZBS > 99.5% >

1.2

1.2.1

5.0 mg 10 mL

1.2.2

69 mg

100 mL

9.0 mL 10 mL

1.0 mL

1.2.3

55 mg

100 mL

9.0 mL 10 mL

1.3

75 cm × 75 μm i. d. 63

12.0 kV 220 nm 10 min

BGE 40

3 min

BGE 5 min

0.1 mol/L NaOH 10 min

9.1-14]

2

2.1

2.1.1

BGE

BGE Zeta

BGE 20 min

BGE 20

30 40 mmol/L BGE

2.1.2

pH

pH 9.0

pH 9.4

pH 9.3

2.1.3
精密称取各溶液、内标溶液分别重力进样，进样量的误差。分别考察了泮托拉唑钠、盐酸氯丙嗪、奥美拉唑在此实验条件下不出峰，萘普生和异丙嗪的峰迁移时间太长，芦丁的迁移时间和峰形虽较好，但其峰与内标物峰面积比

2.3

内标的选择

系统适用性试验

精密称取注射用头孢哌酮钠他唑巴坦钠(1. CFSTZI)

2.5

LOD

LOQ

<table>
<thead>
<tr>
<th>Compound</th>
<th>Regression equation</th>
<th>Linear range g/L</th>
<th>( r )</th>
<th>LOD g/L</th>
<th>LOQ g/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFRS</td>
<td>( Y = 4.6868X - 0.4681 )</td>
<td>0.25 - 3.96</td>
<td>0.9995</td>
<td>0.063</td>
<td>0.19</td>
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<tr>
<td>TZBS</td>
<td>( Y = 0.9157X - 0.0831 )</td>
<td>0.062 - 0.99</td>
<td>0.9996</td>
<td>0.019</td>
<td>0.057</td>
</tr>
</tbody>
</table>

\( Y \) peak area ratio of the compound to the internal standard; \( X \) mass concentration of the compound g/L.
析。以相对峰面积按标准曲线法计算

样品分析，结果见表

用头孢哌酮钠他唑巴坦钠中头孢哌酮钠和他唑巴坦
化选择，经大量试验得出所建立的方法重现性、精密
经济性和实用性。

样品含量测定

精密称取

实际样品中

的含量

表

表


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