

论文

8种氨基糖苷类抗生素的电喷雾离子阱质谱

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摘要:

目的探讨8种结构相似的氨基糖苷类抗生素的质谱裂解规律。方法在正离子检测方式下,用电喷雾离子阱质谱法对庆大霉素、小诺霉素、西索霉素、依替米星、奈替米星、威替米星、卡那霉素A和妥布霉素进行多级质谱分析。结果各化合物在二级质谱分析时,均可发生B环与C环之间的糖苷键断裂,生成脱去C环(氨基葡萄糖)的碎片离子m/z 322(庆大霉素、小诺霉素和西索霉素)、m/z 350(依替米星、奈替米星和威替米星)和m/z 324(卡那霉素和妥布霉素);在三级质谱分析时,则进一步发生A环(氨基葡萄糖)与B环(脱氧链霉素)之间的糖苷键断裂,生成A环或B环的碎片离子m/z 163和m/z 191或m/z 160和m/z 162。结论通过多级质谱分析可获得氨基糖苷类抗生素分子丰富的结构信息,并可用于该类化合物的快速结构解析和定量分析。

关键词: 电喷雾离子阱质谱法 氨基糖苷类抗生素 结构解析

Electrospray ion trap mass spectrometry of eight aminoglycoside antibiotics

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Abstract:

AimTo study the dissociation pathways of aminoglycoside antibiotics. MethodsIn positive mode, eight aminoglycoside antibiotics were elucidated by use of electrospray ion trap mass spectrometry in the multi-stage MS full scan mode. ResultsIt was demonstrated that the eight aminoglycoside antibiotics gave abundant product ions at m/z 322 (gentamicin, micromomicin and sisomicin), m/z 350 (etimidin, netilmicin and vetilmicin) and m/z324 (kanamycin and tobramycin) by loss of the C-ring (amino-α-D-glucopyranose) in MS² full scan mode. In MS³ full scan mode, the prominent fragmentation ions at m/z 163 as well as m/z191 were formed from the fragmentation ions atm/z 322, m/z350 and m/z324 by loss of the A-ring (amino-α-D-glucopyranose), separately, while the characteristic fragmentation ions at m/z 160 as well as m/z162 were formed from m/z 322, m/z350 and m/z324 by loss of the B-ring (2-deoxy-D-streptomine), separately. ConclusionThe structural information was obtained via collision-activated dissociation and these characteristics are applicable to the structural elucidation and quantitative analysis of aminoglycoside compounds.

Keywords: aminoglycoside antibiotics structural elucidation electrospray ion trap mass spectrometry

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