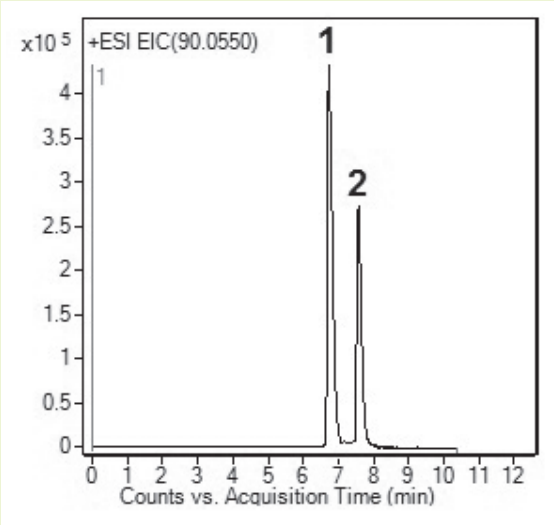
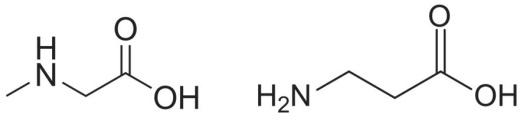
Sarcosine

Separation of potential urine biomarker from isobaric ß-alanine





1. Sarcosine

2. β-Alanine

Note: When reversed phase columns were evaluated for their ability to separate sarcosine from beta-alanine, both compounds eluted at the solvent front and were not separated. To achieve separation, a very intensive sample preparation has to be employed (e.g. derivatization) when using RP methods.

Method Conditions

Column: **Cogent Diamond Hydride™**, 4µm, 100Å

Catalog No.: 70000-15P-2

Dimensions: 2.1 x 150 mm

Solvents: A: 50% isopropyl alcohol / 50% DI water / 0.1% acetic acid
B: 97% acetonitrile / 3% DI water / 0.1% acetic acid

Gradient:

time (min.)	%B
0	75
3	75
4	65
5	65
10	20
12	75

Post Time: 5 min

Injection vol.: 1 microL

Flow rate: 0.6 mL/min

Temperature: 50˚C

Sample: 10 mg/L ea. of sarcosine and beta-alanine in 50:50 A:B

Detection: ESI – POS - Agilent 6210 MSD TOF mass spectrometer

Discussion

This developed LC-MS method can separate sarcosine from beta-alanine in serum and urine samples without using labor-intensive sample derivatization. Since sarcosine is considered a potential biomarker for prostate cancer risk and aggressiveness, it is essential to resolve and accurately quantify this compound in the presence of isobaric (same m/z) beta-alanine. This objective is achieved using a Cogent Diamond Hydride column and a simple gradient method presented in this application note. The developed method is sensitive, specific, quantitative, and reproducible (%RSD = 0.1). It can be used in large scale studies with numerous samples (high throughput of the method due to simple sample preparation).

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