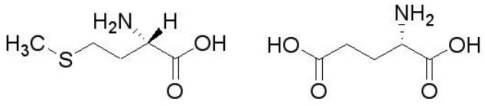
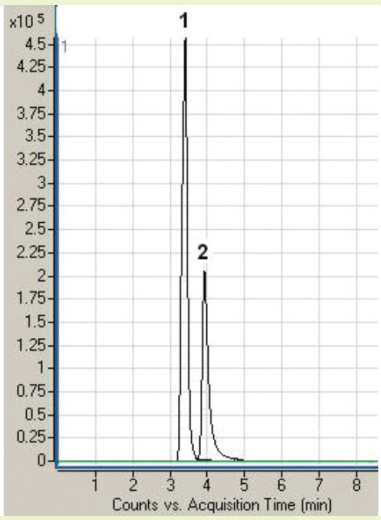
Non Derivatized Amino Acids

from Synthetic Urine



1. L - methionine

2. L - glutamic acid



Notes: The determination of amino acids in biological fluids is important in clinical biochemistry and analytical chemistry. For example measuring methionine concentrations in retinal venous occlusive disease (RVO) is essential. In addition, increased methionine concentrations have been implicated in a variety of other clinical conditions, including neural tube defects, spontaneous abortion, placental abruption, osteoporosis, diabetic angiopathy, and neurological disorders. Methionine is an important amino acid involved in protein synthesis and transmethylation reactions. It is also the precursor of homocysteine and cysteine, two important risk factors for cardiovascular diseases. As homocysteine research has gained interest, the evaluation of methionine concentrations in physiological fluids has acquired importance. Glutamic acid is a major excitatory neurotransmitter in the mammalian central nervous system. Studies have shown that the changes in the amount of Glu in special brain regions are an indication of Parkinson's disease (PD).

Method Conditions

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

Catalog No.: 70000-15P-2

Dimensions: 2.1 x 150 mm

Solvents: A: DI H_2O/ 0.1% formic acid/ 0.005% TFA
B: Acetonitrile/ 0.1% formic acid/ 0.005% TFA

Gradient:

time (min.)	%B
0	95
5	95
6	90
9	90
10	80

Flow rate: 0.4 mL/min

Detection: ESI – pos – Agilent 6210 MSD TOF mass spectrometer

Sample: Synthetic urine

Peaks: 1. L – methionine 150 m/z $(M+H)^+$
2. L – glutamic acid 148 m/z $(M+H)^+$

t_0: 1.44 min

Discussion

Amino acid analysis is generally performed by HPLC along with a time consuming pre column derivatization process that is very tedious and adds cost. Using this new method, the derivatization step is eliminated and the compounds are easily quantified. L- Glutamic acid is normally an extremely difficult amino acid to analyze due to the strong adsorption by the smallest amount of residual silanols present on the surface of the columns. And therefore L–glutamic acid is often seen as a very broad peak.

Although we primarily focused on the analysis of amino acids in urine (synthetic or human), the method could also be applied to the determination of these compounds in other physiological fluids.

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