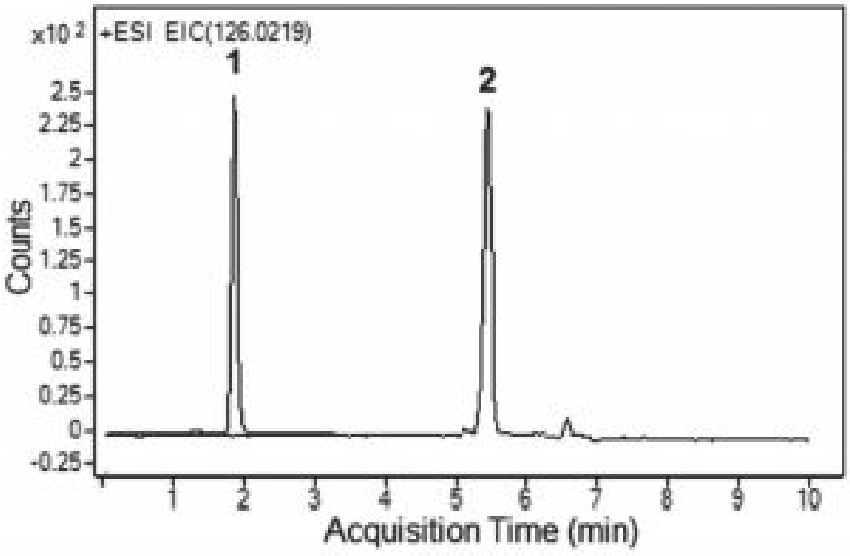
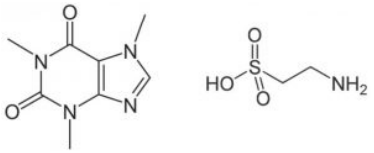
Red Bull Energy Drink Analysis – AppNote

Separation of Taurine and Caffeine with LC-MS

A method combining Solid Phase extraction with high performance liquid chromatography–electrospray ionization tandem Mass Spectrometry was developed for the highly sensitive and accurate screening of Caffeine and Taurine in energy drinks.

The matrix pretreatment by SPE sample extraction was essential in the analysis of Taurine. The matrix did not interfere with the analysis of Caffeine (data not shown). This Method has been successfully applied to screening of Caffeine and Taurine in commercial Red Bull samples, and it is valuable to ensure the safety of food and beverages.





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Peaks:

1. Caffeine 195.0877 m/z [M+H]+
2. Taurine 126.0219 m/z [M+H]+

Method Conditions

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

Catalog No.: 70000-15P-2

Dimensions: 2.1 x 150mm

Mobile Phase:

A: DI Water / 0.1% Formic Acid (v/v)

B: Acetonitrile / 0.1% Formic Acid (v/v)

Gradient:

Time *(minutes)*	%B
0	95
1	95
6	30
7	30
8	95

Temperature: 25˚C

Post Time: 3 minutes

Injection vol.: 1µL

Flow rate: 0.4mL / minute

Detection: ESI – POS – Agilent 6210 MSD TOF Mass Spectrometer

Sample Preparation: Red Bull® was degassed using vacuum and then SPE cartridge UCT Clean Screen® XCEL II (for polar compounds) was used to extract ingredients. After a portion of the Red Bull® drink was passed through the SPE cartridge, ingredients were eluted with Methanol. A portion was filtered through a 0.45µm Nylon Syringe Filter (MicroSolv Tech Corp.).

t_0: 0.9 minutes

Note: *Taurine, a common ingredient in energy drinks, is an amino acid. It is an essential nutrient because of its postulated role(s) as an inhibitory neurotransmitter or neuromodulator. It also affects nervous tissue. Taurine is the only major amino acid to decrease in concentration during brain development. In Taurine-deficient cats or monkeys, abnormal brain development was observed. Also retinal abnormalities were observed. For that reason, Taurine is added to all breast milk substitutes. In recent studies it was reported that Taurine has been known to protect against ischemia and heart failure.*

COGENT HPLC Columns™

Attachment

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