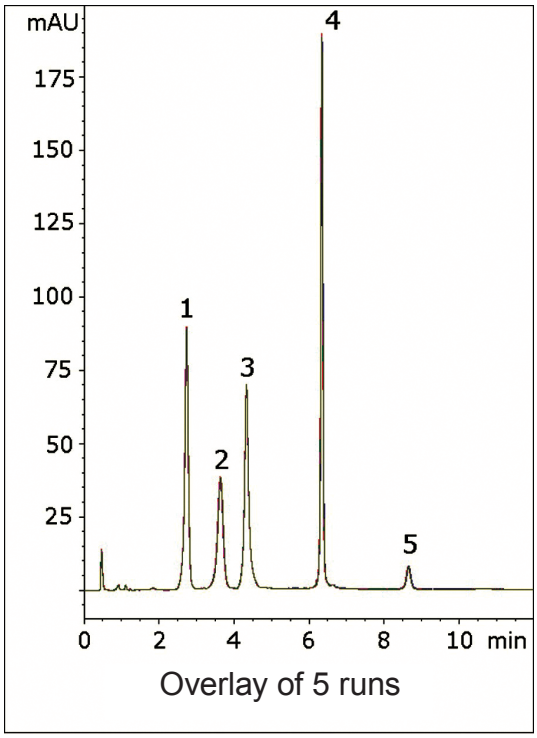
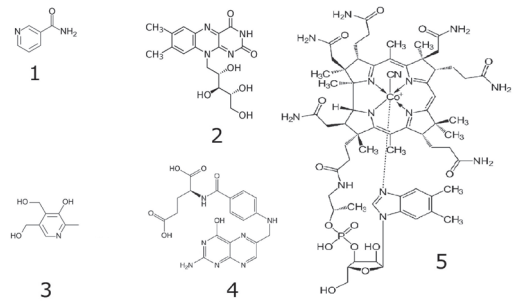
B Vitamins Analysis

Separation of five highly polar vitamins





Note: The word "vitamin" was originally spelled "vitamine" when it was first coined by biochemist Casimir Funk. It was derived from the words "vital" and "amine" because it was believed at the time that all vitamins were chemical amines. The "e" was dropped from the word when it was discovered that this is not the case.

Method Conditions

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

Catalog No.: 70000-7.5P

Dimensions: 4.6 x 75 mm

Solvents: A: DI H_2O / 10 mM ammonium formate
B: 95% acetonitrile / 5% solvent A

Gradient:

time (min.)	%B
0	100
2	100
9	50
10	100

Post Time: 2 min

Injection vol.: 2µL

Flow rate: 1.0 mL/min

Detection: UV 266 nm

Sample: Mix of 0.1 mg/L niacinamide, 0.01 mg/mL riboflavin, 0.3 mg/mL pyridoxine, 0.05 mg/mL folic acid, 1.0 mg/mL cyanocobalamin in 50% solvent A/ 50% solvent B diluent. Peak identities were confirmed by individual standards.

Peaks: 1. Niacinamide
2. Riboflavin
3. Pyridoxine
4. Folic Acid
5. Cyanocobalamin

t_0: 0.9 min

Discussion

The B vitamins are all highly polar and often ion pair agents are needed in reverse phase in order to retain them.

However, these agents are incompatible with LC-MS and therefore limit the applications of these methods.

In this method using the Diamond Hydride™ column, excellent separation is obtained with MS-compatible mobile phase solvents. In addition, the repeatability is excellent, as the five run overlay in the figure shows.

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