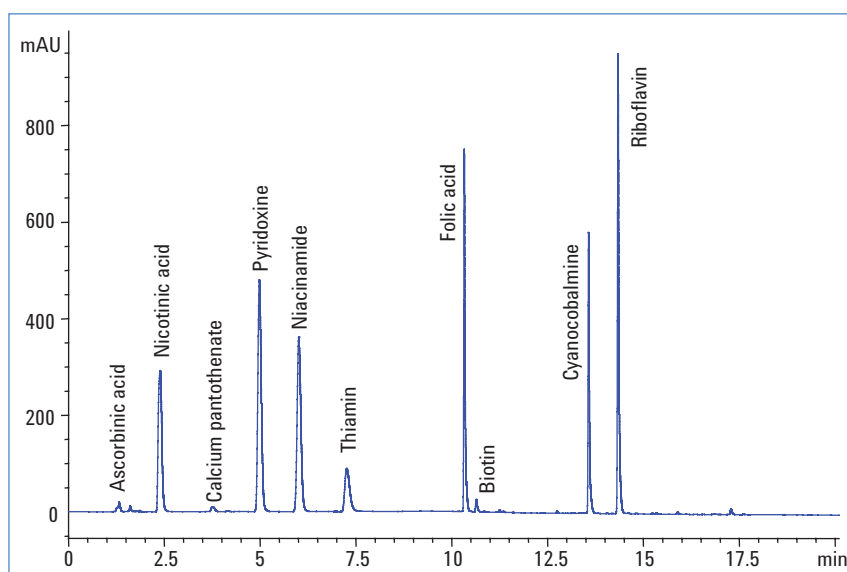




Analysis of water-soluble vitamins from multivitamin tablets for nutrition labeling



Abstract

- Method Development
- Method Validation
- Sample preparation
- Real-life sample analysis

In this Agilent Application Solution, we describe an application to carry out qualitative and quantitative analysis of water soluble vitamins. Unlike a number of different traditional methods which quantify the components individually this Application Solution describes a single and robust reverse phase HPLC method for simultaneous determination of 10 different vitamins. Separation and quantification was done on an Agilent 1260 Infinity LC system using a Poroshell EC-C18 Column and UV detection. As each vitamin has a different absorbance maximum, eight separate wavelengths were selected for acquisition. Finally, this method was effectively transferred to a fast UHPLC method using an Agilent 1290 Infinity LC system.

Scope and Benefits

Vitamins are a range of small organic molecules which are vital nutrients required in trace levels and have specific roles to maintain normal health and growth. As these vitamins are not synthesized naturally in human body a balanced diet is mandatory to keep the amount of vitamins at the required level. However, at times dietary habits can create a deficiency of these vitamins. For these conditions, multivitamins tablets are available on the market for the adequate supply of vitamins. However, as the lack of vitamins creates illness, vitamins in excess levels are also equally harmful to health. Labeling the vitamins in these multivitamin tablets is a mandatory requirement by the Food and Drug Administration (FDA).

This clearly emphasizes the importance of having efficient assay methods to quantify vitamins towards the fulfillment FDA nutrition labeling requirements.

Analytes

Ascorbic acid, Nicotinic acid, Calcium pantothenate, Pyridoxine, Niacinamide, Thiamin, Folic acid, Biotin, Cyanocobalamine, Riboflavin

Matrix

Multivitamin tablets

Ordering Information



Agilent 1260 Infinity Quaternary LC system

Description

- 1260 Infinity Quaternary Pump with integrated vacuum degasser
- 1260 Infinity High Performance Autosampler
- 1260 Infinity Thermostatted Column Compartment
- 1260 Infinity Diode Array Detector
- Max-Light flow cell (60 mm path length)

Part Number

G1311B
G1367E
G1316C
G4212B
Option #031

Agilent 1290 Infinity LC system

Description

- 1290 Infinity Binary Pump with integrated vacuum degasser
- 1290 Infinity High Performance Autosampler
- 1290 Infinity Thermostatted Column Compartment
- 1290 Infinity Diode Array Detector

Part Number

G4220 A
G4226A
G1316C
G4212A

Software

Agilent ChemStation B.04.03 or higher

Columns

Description

Poroshell 120 EC-C18 column 3.0 x 150 mm, 2.7 μ m
Poroshell 120 EC-C18 column 2.1 x 75 mm, 2.7 μ m

Part Number

693975-302
697775-902

Chemicals

HPLC grade solvents

Potassium phosphate, O-Phosphoric acid, Sodium hydroxide and standards of ascorbic acid (C), nicotinic acid (B3), calcium pantothenate (B5), pyridoxine (B6), niacinamide (B3), thiamine (B), folic acid(B9), biotin(B7), cyanocobalamine (B12), and riboflavin (B2) were purchased from regular suppliers.

For full details of this application see

Agilent Application Note 5990-7950EN

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