HPLC Analysis of Vitamins in Tablets using HPLC

Angelika Gratzfeld-Huesgen

Food

Abstract

Fat-soluble vitamins, such as vitamins E, D, and A, and water-soluble vitamins, such as vitamins C, B_6, B_2, B_1, and B_{12}, have been analyzed.

Vitamins are biologically active compounds that act as controlling agents for an organism's normal health and growth. The level of vitamins in food may be as low as a few micrograms per 100 g. Vitamins often are accompanied by an excess of compounds with similar chemical properties. Thus not only quantification but also identification is mandatory for the detection of vitamins in food. Vitamins generally are labile compounds that should not exposed to high temperatures, light, or oxygen. HPLC separates and detects these compounds at room temperature and blocks oxygen and light.[1] Through the use of spectral information, UV-visible diode-array detection yields qualitative as well as quantitative data. Another highly sensitive and selective HPLC method for detecting vitamins is electrochemical detection.

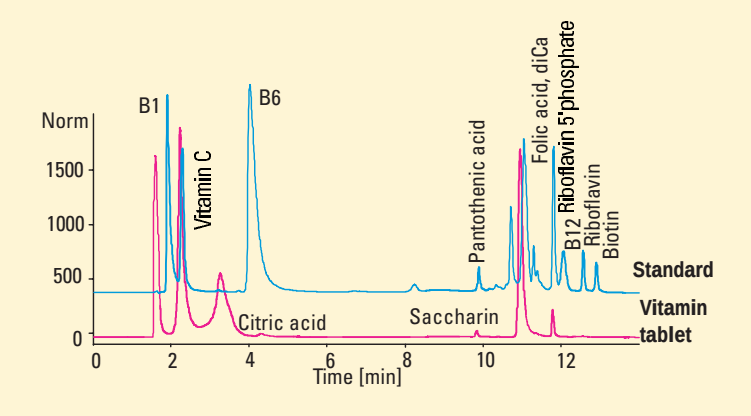

Figure 1
Analysis of water-soluble vitamins in a vitamin tablet

Conditions

Column 100 ˘ 4 mm Hypersil BDS, 3 µm
Mobile phase
A= water with pH = 2.1 (H_2SO_4) = 99%
B = ACN + 10% A = 1 %
Gradient
at 3.5 min 1% B; at 11 min 25% B
at 19 min 90% B
Post time 6 min
Flow rate 0.5 ml/min
Column compartment 30 ºC
Injection vol 2–5 µl
Detector
UV-DAD detection wavelength 220/30 nm, reference wavelength 400/100 nm

Sample preparation
Filtration

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Sample preparation

Different food matrices require different extraction procedures.[1] For simple matrices, such as vitamin tablets, water-soluble vitamins can be extracted with water in an ultrasonic bath after homogenization of the food sample.

Chromatographic conditions

The HPLC method presented here was used to analysis vitamins in a vitamin drink.

HPLC method performance

Limit of detection
<500 pg (injected amount),
S/N = 2

Repeatability of
RT over 10 runs <0.2 %
areas over 10 runs <2 %

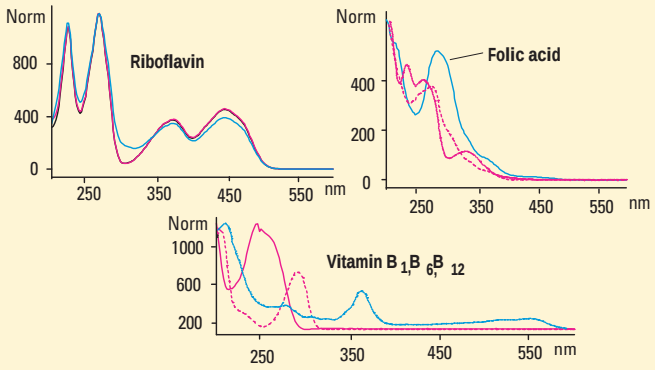


Figure 2
Analysis of carbohydrates in corn extract

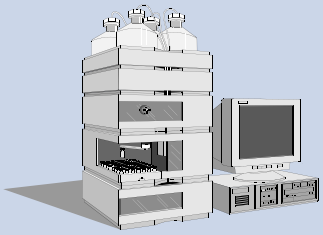
References

1.
L.M. Nollet, "*Food Analysis by HPLC*", New York, **1992**.

Equipment

Agilent 1100 Series
- vacuum degasser
- quaternary pump
- autosampler
- thermostatted column compartment
- diode array detector

Agilent ChemStation + software



Rainer Schuster is application chemist at Agilent Technologies, Waldbronn, Germany.

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