Analysis of Vanillin Extract Quality using HPLC

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Food

Abstract

The following compounds are examples of flavoring agents used in food products:
- lupulon and humulon (hop bittering compounds)
- vanillin
- naringenin and hesperidin (bittering compounds)

Three major classes of compounds are used as flavoring agents: essential oils, bitter compounds, and pungency compounds. Although the resolution afforded by gas chromatography (GC) for the separation of flavor compounds remains unsurpassed, HPLC is the method of choice if the compound to be analyzed is low volatile or thermally unstable.

Sample preparation

Turbid samples require filtration, whereas solid samples must be extracted with ethanol. After filtration, the solution can be injected directly into the HPLC instrument.

Conditions

Column 100 º 4 mm Hypersil BDS, 3 µm
Mobile phase
A = water + 0.15ml H₂SO₄ (conc.), pH = 2.3
B = ACN
Gradient
start with 10% B
at 3 min 40% B; at 4 min 40% B
at 6 min 80% B; at 7 min 90% B
Flow rate 0.8 ml/min
Post time 3 min
Column compartment 30 °C
Injection vol 5 µl
Detector
UV-DAD detection wavelength 280/80 nm, reference wavelength 360/100 nm

Sample preparation

Injection without further preparation

Figure 1
Determination of the quality of vanillin extract
Chromatographic conditions

The HPLC method presented here for the analysis of vanillin is based on reversed-phase chromatography. UV spectra were evaluated as an additional identification tool.  

HPLC method performance

Limit of detection
0.2–5 ng (injected amount)
S/N = 2

Repeatability
of RT over 10 runs <0.2 %
of areas over 10 runs <1 %

Figure 2
Analysis of vanillin in cognac. Identification of vanillin through spectra comparison

References