

Authenticity Verification

Example: Vanilla Products



Analytical Objective

The precise analysis and differentiation of vanillin, its natural accompanying components, and synthetic compounds in a variety of products.

Analyzed Substances

- Vanillin
- 4-Hydroxybenzoic acid
- 4-Hydroxybenzaldehyde
- Vanillic acid
- Ethylvanillin
- Vanillyl alcohol
- Coumarin

Method

Quantitative determination using **UPLC-UV-DAD**
LC-MS/MS with two **MRM** channels for confirmation.

Sample Material

- Vanilla pods
- Vanilla extracts
- Vanilla sugar preparations
- Vanilla flavorings

Background

Vanilla is one of the most popular and versatile flavors in the food, pharmaceutical, and cosmetics industries. Due to the high demand and rising prices of genuine vanilla extracts, cost-effective alternatives such as nature-identical vanillin or synthetic flavoring substances are increasingly used.

The developed **UPLC-DAD/LC-MS/MS** coupling allows for reliable quantification and differentiation of the key natural and synthetic vanilla components. It is ideally suited for **authenticity screening** and enables targeted quality control.

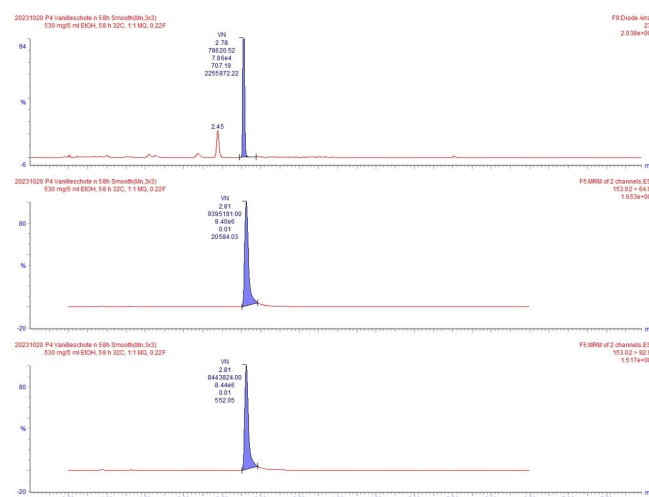


Fig. 1: Ethanolic extract from genuine Bourbon vanilla, top: UV 275 nm UV chromatogram with integrated vanillin peak, middle and bottom: 2 MRM channels of vanillin for confirmation.

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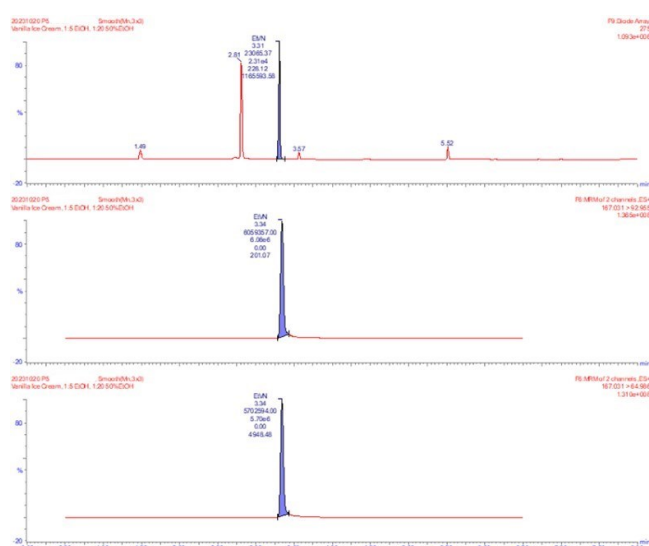


Fig. 2: Food flavoring "Vanilla Ice Cream," top: UV 275 nm UV chromatogram with integrated ethylvanillin peak, middle and bottom: 2 MRM channels of ethylvanillin for confirmation.

This method provides a validated foundation for identifying and distinguishing natural and synthetic vanilla components - an essential step for quality assurance, product safety, and consumer protection.

With over 25 years of experience in the analysis of secondary plant compounds and vitamins, the characterization of natural extracts, and the assessment of plant-based raw materials, BioTeSys offers you reliable and customized analytical solutions for evaluating the quality of your raw materials and products.

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