



**VARIAN**

Application Note SI-01129

## Analysis of Carnauba Wax using a VF-5ht UltiMetal™ Column

John Oostdijk  
Varian, Inc.

Carnauba wax originates from the leaves of carnauba palm in Brazil. It is widely used in lipsticks, eyeliners and sun care preparations, automobile waxes, shoe and guitar polishes, and candies because of its glossy finish. The wax is a formulation aid in sauces, chewing gum and juices, a surface finishing agent in baked foods, and a tablet coating agent.

Carnauba wax contains mainly wax esters in the C46–C54 range with some small amounts of free acids, alcohols and resins. The VF-5ht UltiMetal column is ideal for the analysis of carnauba wax. This column has been developed using the proprietary UltiMetal technology that provides a virtually unbreakable metal column material with excellent inertness properties similar to fused silica tubing. The UltiMetal treated column tubing is coated with the VF-5 low bleed arylene stabilized phase resulting in a highly temperature stable and durable column perfectly suited for a variety of high temperature applications.

The C46–C54 wax esters of the carnauba wax elute in the 275 °C to 400 °C temperature range in this analysis, while the lighter free acids and alcohols fraction elutes between 220 °C and 250 °C.

The low bleed characteristics of this column, evident above 350 °C, allow the accurate quantification of minor high boiling impurities. The high maximum column temperatures enable a fast bake-out of highly retained sample material.

**Conditions**  
Technique: CP-3800 GC  
Column: VF-5ht UltiMetal, 15 m x 0.32 mm,  
Df = 0.1 µm + Retention Gap, 2 m x 0.53 mm  
Sample: Carnauba wax, saturated (approx 0.1 %) in CS<sub>2</sub>  
Sample Size: 1.0 µL  
Carrier Gas: Hydrogen, constant flow mode 10 mL/min  
Injector: On-column (1093), reversed liner, 100 °C (0 min) to  
400 °C with 15 °C/min  
Temperature: 50 °C (1 min) to 450 °C (20 mins) with 10 °C / min  
Detection: FID (HT), 400 °C

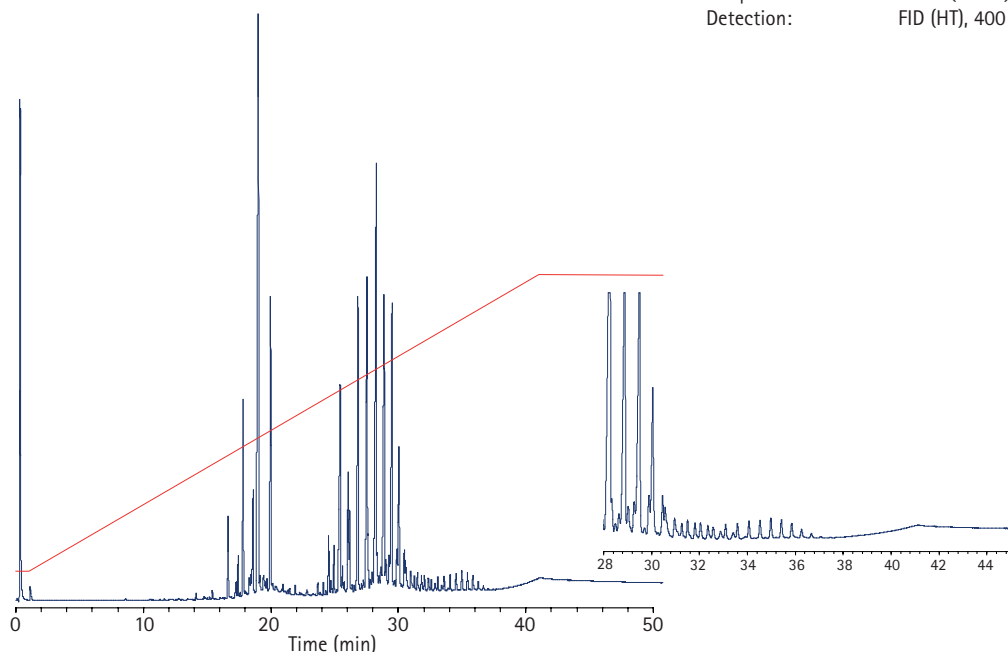


Figure 1. Analysis of carnauba wax using a VF-5ht UltiMetal column.

These data represent typical results.  
For further information, contact your local Varian Sales Office.

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Varian, Inc.  
www.varianinc.com  
North America: 800.926.3000 – 925.939.2400  
Europe: *The Netherlands*: 31.118.67.1000  
Asia Pacific: *Australia*: 613.9560.7133  
Latin America: *Brazil*: 55.11.3238.0400



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