Analysis of Fragrance and Allergens using an Agilent J&W FactorFour VF-WAXms GC Column

Introduction

Allergic reactions to perfumes and the individual components responsible for these reactions have been studied since the late 1970s. The fragrance mix used internationally to diagnose fragrance-allergic patients includes eight ingredients: oak moss extract, iso-eugenol, eugenol, cinnamal, hydroxy citronellal, geraniol, cinnamyl alcohol and amyl cinnamal. Analysis of this particular fragrance mix on a VF-WAXms reveals the presence of a number of these common allergens. The MS compatibility of VF-WAXms is clearly evident, especially in the low bleed profile around 250 °C, as shown in Figure 1 on page 2.
Conditions
Technique: GC-MS
Column: VF-WAXms
Column: 30 m x 0.25 mm x 0.25 µm (part number CP9205)
Oven: 100 °C to 250 °C with 10 °C / min
Carrier Gas: Helium, 1.0 mL/min
Injector: Split 1:30, T = 250 °C
Detector: GC-MS Iontrap
Trap: 290 °C
Manifold: 60 °C
Sample Size: 0.1 µL
Sample: Fragrances mixture (500 ppm)

Peak Identification:
1. Linalool
2. Methyl heptin carbonate
3. Phenyl acetaldehyde
4. Methyl chavicol
5. Methyl octin carbonate
6. Citronellol
7. Geraniol
8. Methyl gamma ionone
9. Benzyl alcohol
10. Cinnamaldehyde
11. Hydroxy citronellal
12. Methyl eugenol
13. Lilial
14. Eugenol
15. Amyl cinnamyl aldehyde
16. Anisic alcohol
17. Cinnamyl alcohol
18. Farnesol isomer I + II
19. Farnesol isomer III
20. iso-Eugenol
21. Hexyl cinnamic aldehyde
22. Lyral (4,4-isomer)
23. Coumarine
24. Amyl cinnamic alcohol
25. Benzyl benzoate
26. Benzyl salicylate
27. Benzyl cinnamate

Figure 1. Analysis of fragrance and allergens using VF-WAXms GC columns