



Sterols

Analysis of cholesterol oxidation products (COPs) as TMS derivatives

Application Note

Food Testing & Agriculture

Authors

Agilent Technologies, Inc.

Introduction

COPs are analyzed because of their potential toxicity. GC analysis was performed on their TMS derivatives to avoid thermal degradation and incomplete separation of some COPs. The Agilent CP-Sil 5 CB Low Bleed/MS column permits determining a wide range of COPs with different functional groups in only 20 minutes and gives good resolution of the most common cholesterol oxides. Moreover, this GC method is suitable for the evaluation of the oxidation process in food matrixes, such as egg yolk powder. Proper sample fractionation by SPE prior to GC analysis can ensure accurate oxysterol quantitation.



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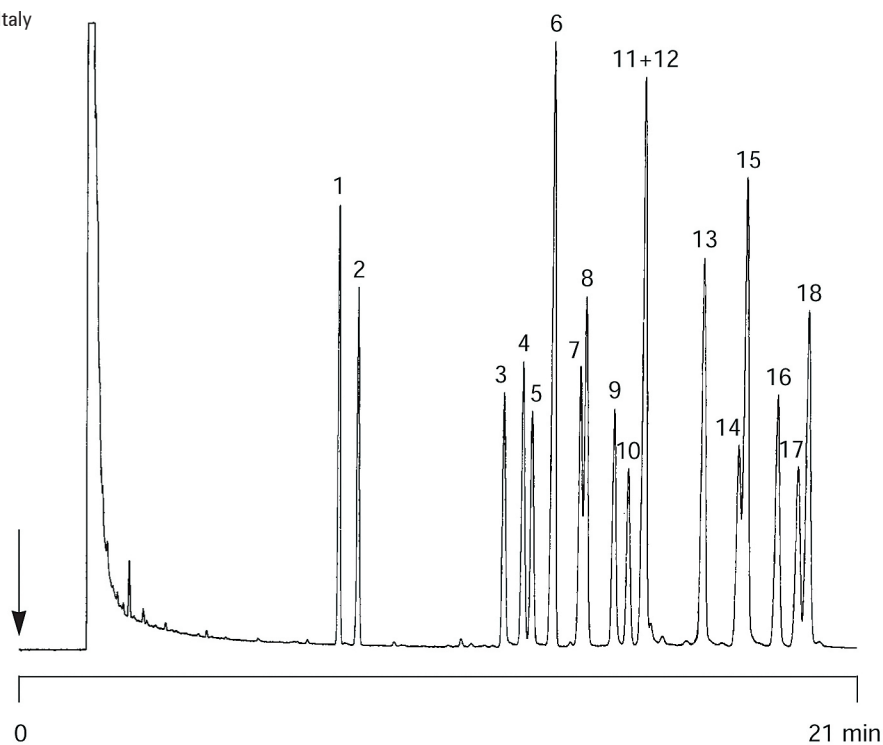
Conditions

Technique : GC-capillary
Column : Agilent CP-Sil 5 CB Low Bleed/MS, 0.25 mm x 25 m
(df = 0.12 μm) (Part no. CP7840)
Temperature : 245 $^{\circ}\text{C}$ \rightarrow 265 $^{\circ}\text{C}$, 3.5 $^{\circ}\text{C}/\text{min}$;
265 $^{\circ}\text{C}$ \rightarrow 310 $^{\circ}\text{C}$, 0.5 $^{\circ}\text{C}/\text{min}$
Carrier Gas : He, 80 kPa (0.80 bar)
Injector : Split, 100 mL/min
T = 325 $^{\circ}\text{C}$
Detector : FID
T = 325 $^{\circ}\text{C}$
Sample Size : 1 μL
Concentration Range : 0.1 - 0.5 mg/mL
Sample Solvent : hexane

Courtesy : Maria T. Rodriguez-Estrada, Francesca Capuci and
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Peak identification

1. 5 α -cholestane
2. cholesta-3,5-diene
3. 5-cholesten-3 β ,7 α -diol (7 α -OH)
4. cholesterol
5. dihydrocholesterol
6. cholesta-3,5-dien-7-one
7. 5-cholesten-3 β ,19-diol (19-OH)
8. 4-cholesten-3-one
9. 5-cholesten-3 β ,7 β -diol (7 β -OH)
10. 5-cholestan-5 β ,6 β -epoxy-3 β -ol
11. 5-cholestan-5 α ,6 α -epoxy-3 β -ol
12. 5-cholesten-3 β ,4 β -diol (4 β -OH)
13. 5-cholesten-3 β ,20 α -diol (20 α -OH)
14. 5 α -cholestan-3 β -ol-7-one
15. cholestane-3 β ,5 α ,6 β -triol (triol)
16. 5 α -cholestan-3 β -ol-6-one
17. 5-cholesten-3 β -ol-7-one (7-k)
18. 5-cholesten-3 β ,25-diol (25-OH)



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