

Simple Concentration and Analysis of Fresh Flower Fragrance Components - Using Sorptive Media MonoTrap

Preliminary processing procedure

One fresh flower (Mizusen)

Collection (passive)
MonoTrap DCC18 x 5 sheets

In ambient air for
24 hours

Solvent extraction

1000 μ L of diethyl ether
5 minutes of ultrasonication

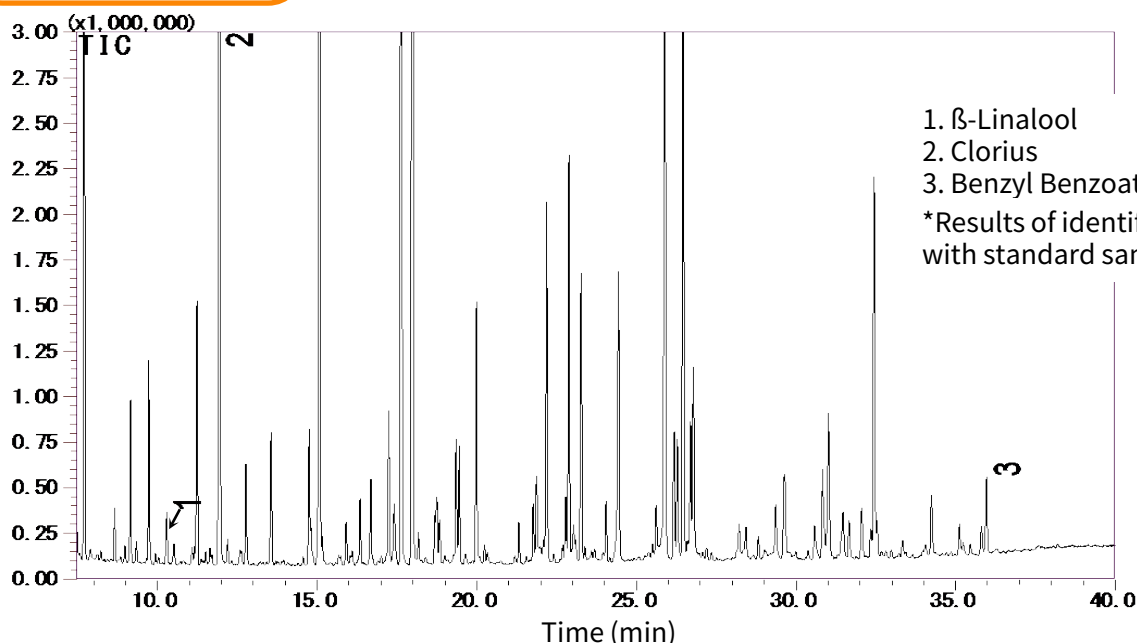
Concentration

With nitrogen purging
Concentrate to a few μ L

GC/MS

GC Conditions

System : GC - MS
Column : InertCap Pure-WAX
 0.25 mm I.D. x 30 m df = 0.25 μ m
Col. Temp. : 70 °C - 4 °C /min - 220 °C
Carrier Gas : He 90 kPa
Injection : Split 1:10
 250 °C
Detection : MS Scan (m/z 50-450)
Sample Size : 1 μ L



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Sample name and retention index

Component	RI	Component	RI	Component	RI
1. Methanol	362	24. 2-Methyl-1-propanol (Isobutyl alcohol)	624	45. 3-Methyl-1-butanol (Isoamyl alcohol)	731
2. Ethanol	439	25. Tetrahydrofuran	630	46. 4-Methyl-2-pentanone(MIBK)	739
3. Acetonitrile	486	26. 2-Methoxyethanol (Methyl cellosolve)	630	47. Pyridine	748
4. Acetone	488			48. 1-Pentanol(Amyl alcohol)	764
5. 2-Propanol(Isopropyl alcohol)	488	27. 1,2-Dimethoxyethane	650	49. Isobutyl acetate	772
6. n-Pentane	500	28. 1,1,1-Trichloroethane	650	50. Toluene	774
7. Diethyl ether	504	29. 1,2-Dichloroethane	650	51. N,N-Dimethylformamide	781
8. Ethyl formate	515	30. 2,2-Dimethoxypropane	650	52. 2-Hexanone(MBK)	789
9. 1,1-Dimethoxymethane	515	31. Methyl isopropyl ketone	658	53. Propionaldehyde diethyl acetate	811
10. 1,1-Dichloroethylene	518	32. Isopropyl acetate	658	54. n-Butyl acetate	811
11. Methyl acetate	524	33. 1-Butanol	658	55. Dimethyl sulfoxide(DMSO)	834
12. Dichloromethane	530	34. Benzene	666	56. Chlorobenzene	858
13. 1-Propanol	550	35. Carbon tetrachloride	666	57. N,N-Dimethylacetamide	870
14. trans-1,2-Dichloroethylene	560	36. Cyclohexane	666	58. Ethylbenzene	870
15. tert-Butyl methyl ether	562	37. 2-Methyltetrahydrofuran	672	59. p-Xylene	879
16. Nitromethane	564	38. 2,2,4-Trimethylpentane	690	60. m-Xylene	879
17. 2-Butanone(MEK)	597	39. n-Heptane	700	61. o-Xylene	905
18. 2-Butanol	600	40. Trichloroethylene	704	62. Anisole	926
19. n-Hexane	600	41. 2-Ethoxyethanol	712	63. Cumene	936
20. Diisopropyl ether	600	42. n-Propyl acetate	712	64. N-methyl-2-pyrrolidone	1050
21. cis-1,2-Dichloroethylene	611	43. 1,4-Dioxane	712	65. 1,2,3,4-Tetrahydronaphthalene	1194
22. Ethyl acetate	611	44. Methylcyclohexane	731	66. Sulfolane	1232
23. Chloroform	619				

Xylene used is a mixture of m Xylene, p Xylene, o Xylene, and Ethylbenzene.

Retention indices are...

This value is based on the carbon number of straight-chain alkanes and is calculated using the retention time of each component and hydrocarbon.

In this application, a temperature-rise analysis was made. The formula is shown below.

$$\text{Retention index} = 100 \times \frac{\text{TR} - \text{tR(Z)}}{\text{TR(Z+1)} - \text{tR(Z)}} + 100 \times \text{Z}$$

TR = retention time of the target component
 T R(Z) = retention time of straight-chain alkanes that precede the components of interest
 TR(Z+1) = retention time of straight-chain alkanes emerging after the component of interest.
 Z = number of carbon in the straight-chain alkane with retention time tR(Z)

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