GC Technical Note

GT112 GL Sciences Inc. Concentration Analysis of Volatile Components of Japanese Sake (rice wine) - Confirmation of Salting-out effects in MonoTrap's RGC18 TD

Using MonoTrap RGC18 TD and HandyTD TD265, volatile components in Japanese sake were screened and analyzed, with differences in the analytical results compared between the two different collection methods. MonoTrap RGC18 TD is used to collect volatile constituents. HandyTD TD265 is used to introduce the volatile compounds collected on the trapping agent into a GC by thermal desorption. Volatile components were collected by a dip-shaking method (a method in which a MonoTrap is added to sake, with the volatile components collected by shaking with a constant-temperature shaker at 60 °C). The effect of salting-out was confirmed by comparing a method of sample collection without salting out, with a method with sodium chloride added to the sample.

Salting-out improves the sensitivity for all components with detection of many flavor compounds in Japanese sake. In particular, Isovaleraldehyde diethyl acetal, a fragrance substance produced by the deterioration of sake, was detected by salting-out.

Pretreatment procedure



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Analysis results of sake with salt analysis



- 1. Ethyl acetate
- 2. Methanol
- 3. Ethanol
- Isobutyl acetate
- 5.1-Propanol
- 6. Ethyl butyrate
- 7. Isovaleraldehyde diethyl
- acetal
- 8. Isobutanol
- 9. Isoamyl acetate
- 10. Butanol
- 11. 2-Methyl-1-butanol
- 12. Isoamyl alcohol
- 13. Ethyl caproate
- 14. Acetoin
- 15. Acetol
- 16. Ethyl lactate

- 17. Propylene glycol ethyl ether
- 18. Acetic acid
- 19. Furfural
- 20. Formic acid
- 21. Ethyl hydroxybutyrate
- 22. 2,3-Butanediol
- 23. Ethyl 2-hydroxycaproate
- 24.1-Octanol
- 25. Benzaldehyde
- 26. 2,3-Butanediol
- 27. 2-Oxopentanedioic acid
- 28. 5-Methyl-furfural
- 29. 2-Cyclopentene-1,4-dione
- 30. Butanoic acid
- 31. Furfuryl alcohol
- 32. Butyrolactone

- 33. Benzeneacetaldehyde
- 34. Diethyl succinate
- 35. Dodecanal

* Standard samples are not used for qualitative analysis.

Results from a library search.

- 36. Phenylethyl formate
- 37. Caproic acid
- 38. Phenethyl acetate
- 39. Phenylethyl alcohol
- 40. Tetradecanal
- 41.1-Dodecanol
- 42. Octanoic acid
- 43. Dihydroxyacetone
- 44. Diisobutyl adipate
- 45. Myristyl alcohol
- 46. Hydroxydihydromaltol
- 47. Glycerin
- 48. 5-Hydroxymethyl furfural

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