

Concentration Analysis of Volatile Components of Soy Sauce - Comparative Collection Methods Using MonoTrap RGC18 TD

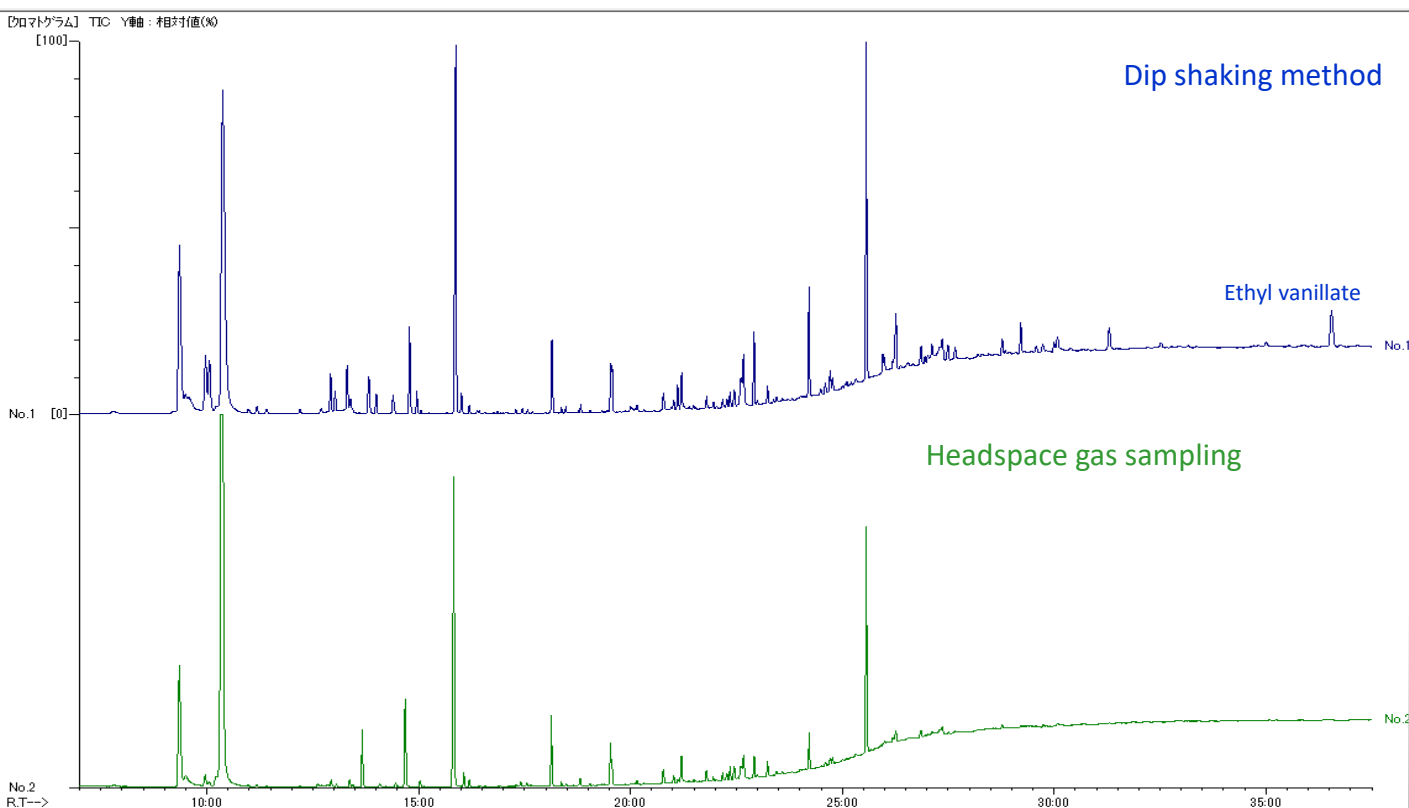
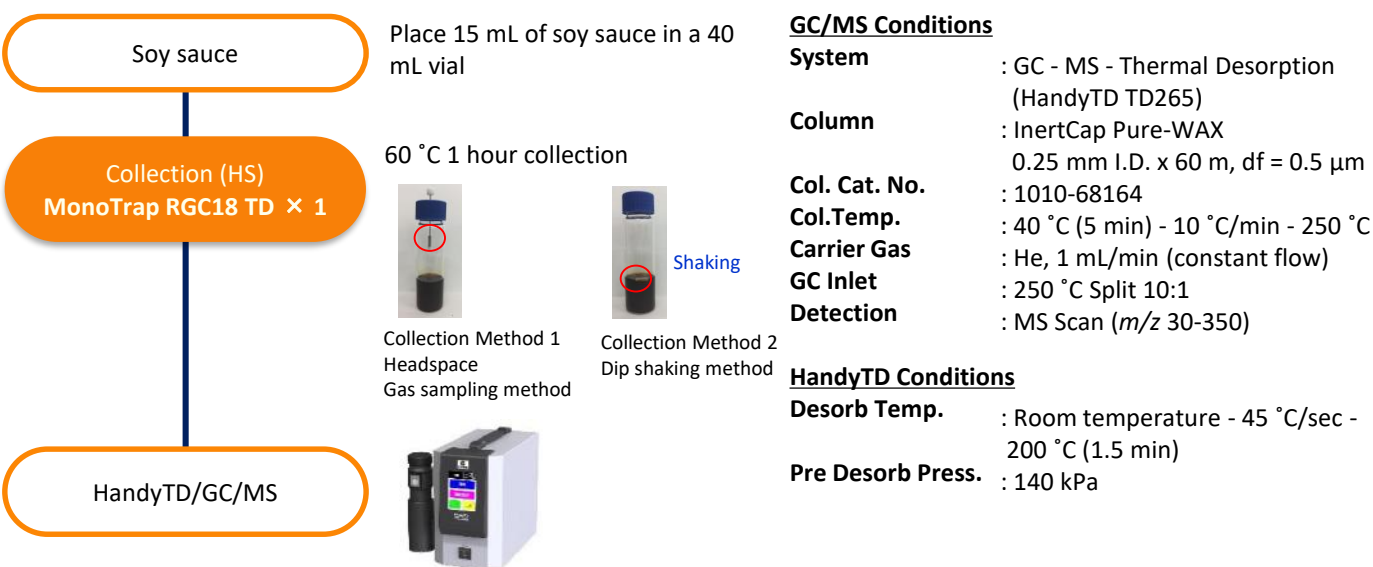
MonoTrap RGC18 TD and HandyTD TD265 were used for simple screening and analysis of volatile components in soy sauce, two different collection methods were compared.

MonoTrap RGC18 TD is used to collect volatile compounds on a trapping agent, HandyTD TD265 is then used to introduce those compounds into a GC by thermal desorption. The two collection methods studied here used headspace gas sampling and dip shaking. Headspace method - volatile components were collected in a 60 °C oven by placing the MonoTrap in the headspace of the container so that it does not come into contact with soy sauce. Dip shaking method - volatile components were collected by shaking with a constant temperature shaker at 60 °C with the MonoTrap in soy sauce.

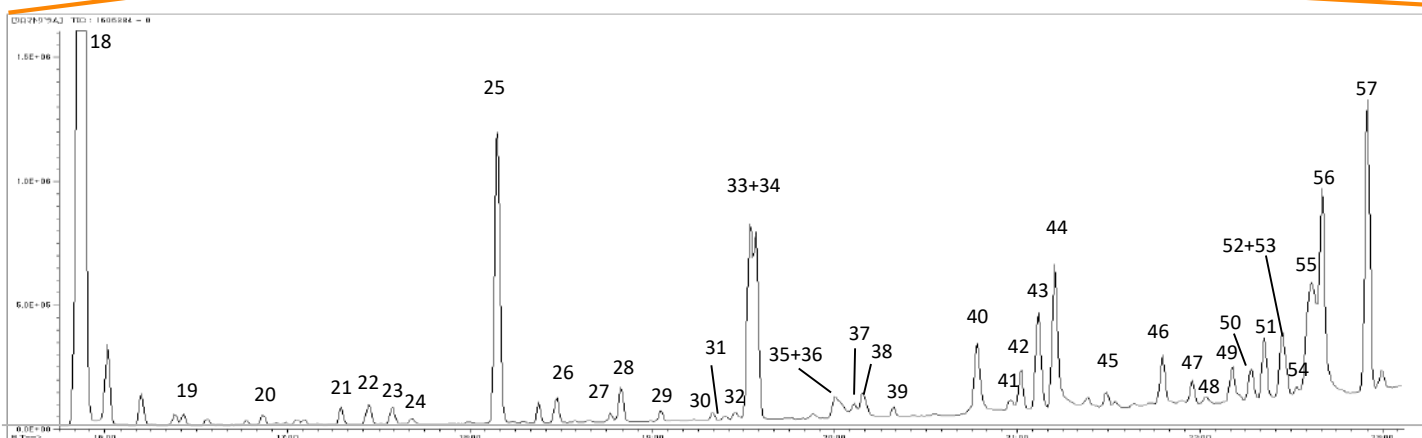
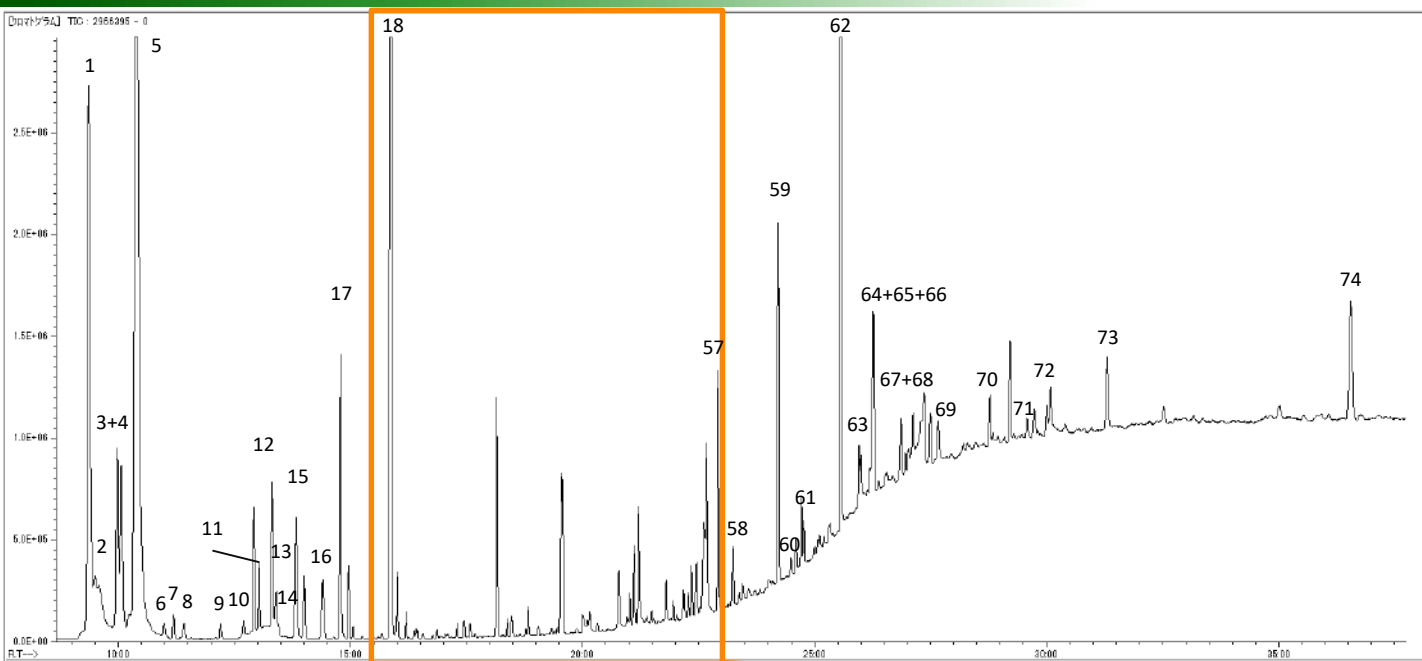
The two collection methods were used to detect many of the important flavor components of soy sauce.

The dip shaking method improved the sensitivity for almost all components compared with headspace gas sampling. In addition, high-boiling components such as ethyl vanillate, which were not detected by headspace gas sampling, were detected by the dip shaking method.

Preliminary processing procedure



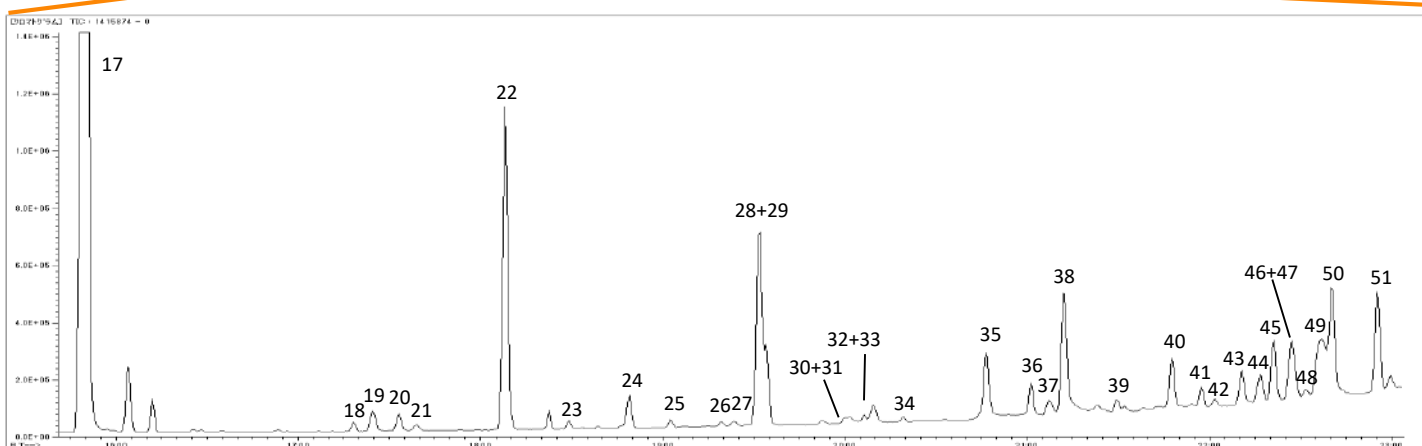
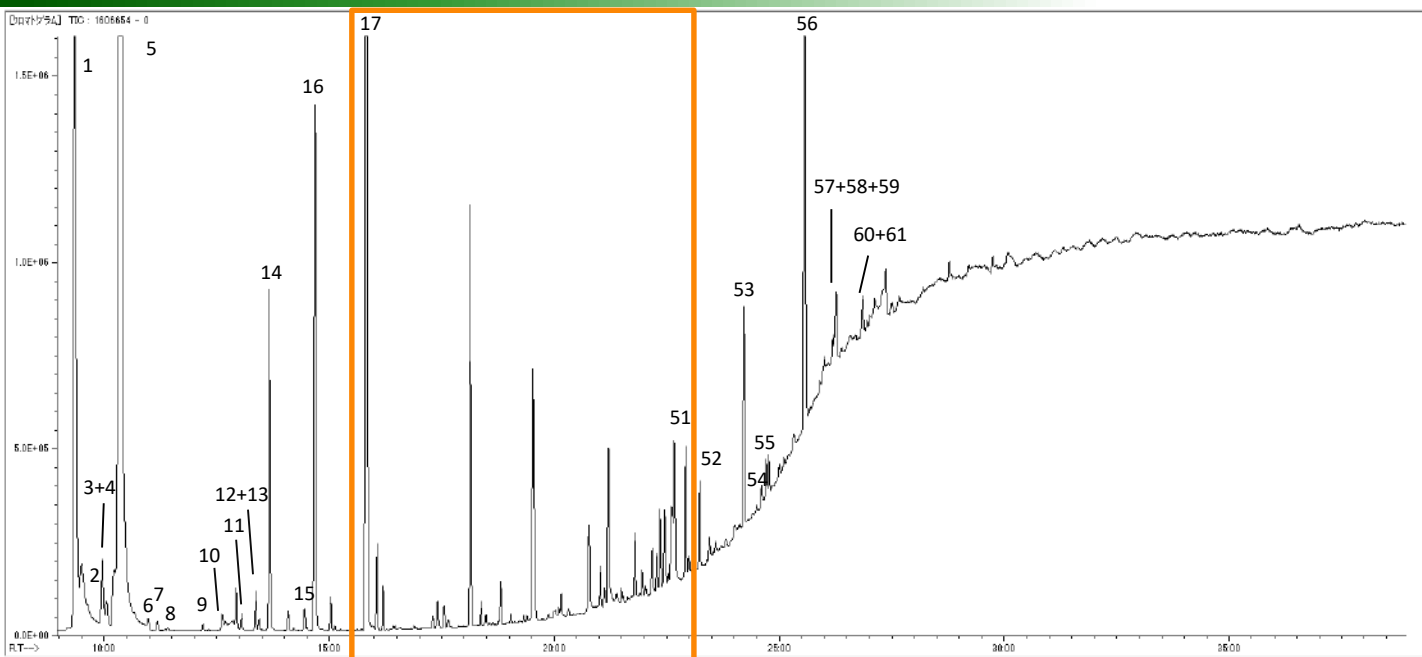
Results of dip shaking method



* Standard samples are not used for qualitative analysis.
Results from a library search.

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|-------------------------------------|--|---|
| 1. Ethylacetate | 26. (5-Methyl-2-furyl)methanethiol | 51. Furfuryl alcohol |
| 2. Methyl alcohol | 27. 3-Octanol | 52. Isovaleric acid |
| 3. Methyl butyraldehyde | 28. 2-(1-Ethoxyethoxy)-3-methyl-1,4-butanediol | 53. 2-methyl butanoic acid |
| 4. Isovaleraldehyde | 29. 2-Ethyl-6-methylpyrazine | 54. Butyrolactone |
| 5. Ethyl alcohol | 30. Trimethylpyrazine | 55. Phenyl acetaldehyde |
| 6. Ethyl propanoate | 31. 4-Hydroxy-3-hexanone | 56. Diethyl succinate |
| 7. Ethyl isobutyrate | 32. Isovaleric anhydride | 57. Ethyl benzoate |
| 8. Isobutanal diethyl acetal | 33. Acetic acid | 58. Methionol |
| 9. Isobutyl acetate | 34. 1-Octen-3-ol | 59. Ethyl phenyl acetate |
| 10. Ethyl butyrate | 35. Methional | 60. Phenethyl acetate |
| 11. Ethyl methylbutyrate | 36. Furfural | 61. Ethyl nicotinate |
| 12. Ethyl isovalerate | 37. Trimethyl-2-hexene | 62. Phenylethanol |
| 11. Butyl acetate | 38. 2-Ethyl-3,5-dimethylpyrazine | 63. 2-Phenyl-2-butenal |
| 14. Isovaleraldehyde diethyl acetal | 39. Tetramethylpyrazine | 64. 2-Acetylpyrrole |
| 15. Isobutyl alcohol | 40. 2,3-Butanediol | 65. Maltol |
| 16. Isoamyl acetate | 41. Hexano-dibutyryn | 66. 2-Methyl-3-methoxy-4H-pyran-4-one |
| 17. 1-Butanol | 42. Ethyl 2-hydroxyhexanoate | 67. Benzyl methyl ether |
| 18. Isoamyl alcohol | 43. Benzaldehyde | 68. Ethylguaiaico |
| 19. Ethyl caproate | 44. 2,3-Butanediol | 69. Ethyl 2-(acetylamino)-4-methylpentanoat |
| 20. 3-Octanone | 45. Ethyl methylthiopropionate | 70. 2-Methoxy-4-vinylphenol |
| 21. Difurfuryl ether | 46. 5-(Pentyloxy)-2-pentene | 71. 2,6-Dimethoxyphenol |
| 22. Acetoin | 47. Ethyl levulinate | 72. Phenylpyridine |
| 23. Ethylene glycol propyl ether | 48. Methylbutyrolactone | 73. Isocitric acid lactone |
| 24. Hydroxyacetone | 49. 5-Isopropyl-2,2-dimethyltetrahydrofuran | 74. Ethyl vanillate |
| 25. Ethyl lactate | 50. Valerolactone | |

Results of headspace gas sampling



* Standard samples are not used for qualitative analysis.
Results from a library search.

- | | | |
|----------------------------------|--|---|
| 1. Ethylacetate | 22. Ethyl lactate | 42. Methylbutyrolactone |
| 2. Methyl alcohol | 23. (5-Methyl-2-furyl)methanethiol | 43. 5-Isopropyl-2,2-dimethyltetrahydrofuran |
| 3. Methyl butyraldehyde | 24. 2-(1-Ethoxyethoxy)-3-methyl-1,4-butanediol | 44. Valerolactone |
| 4. Isovaleraldehyde | 25. 2-Ethyl-6-methylpyrazine | 45. Furanmethanol |
| 5. Ethyl alcohol | 26. Trimethylpyrazine | 46. Isovaleric acid |
| 6. Ethyl propanoate | 27. 4-hydroxy-3-Hexanone | 47. Methyleneacetic acid |
| 7. Ethyl isobutyrate | 28. Acetic acid | 48. Butyrolactone |
| 8. Isobutanal diethyl aceta | 29. 1-Octen-3-ol | 49. Phenylacetaldehyde |
| 9. Isobutyl acetate | 30. Methional | 50. Diethyl succinate |
| 10. Ethyl butyrate | 31. Furfural | 51. Ethyl benzoate |
| 11. Ethyl methylbutyrate | 32. Trimethyl-2-hexene | 52. Methionol |
| 12. Ethyl isovalerate | 33. 2-Ethyl-3,5-dimethylpyrazine | 53. Ethyl phenyl acetate |
| 13. Butyl acetate | 34. Tetramethylpyrazine | 54. Phenethyl acetate |
| 14. Isobutyl alcohol | 35. 2,3-Butanediol | 55. Ethyl nicotinate |
| 15. Isoamyl acetate | 36. Ethyl 2-hydroxyhexanoat | 56. Phenylethanol |
| 16. 1-Butanol | 37. Benzaldehyde | 57. 2-Acetylpyrrole |
| 17. Isoamyl alcohol | 38. 2,3-Butanediol | 58. Maltol |
| 18. Difurfuryl ether | 39. Ethyl methylthiopropoate | 59. 2-Methyl-3-methoxy-4H-pyran-4-one |
| 19. Acetoin | 40. 5-(Pentyloxy)-2-pentene | 60. Benzyl methyl ether |
| 20. Ethylene glycol propyl ether | 41. Ethyl levulinat | 61. Ethylguaicol |
| 21. Acetol | | |

Product used

MonoTrap RGC18 TD



Cat.No. :1050-74201

* Supplied individually packaged in ampoules.

MonoTrap Trial Kit for TD for thermal desorption



Portable thermal desorber HandyTD TD265



Cat.No. : 2709-80000

InertCap Pure-WAX



Size : 0.25 mm I.D. x 60 m, df = 0.5 μ m

Cat.No. : 1010-67164

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