GC Technical Note
GT122
GL Sciences Inc.

Enrichment Analysis of Volatile Components from Hairbrush — Sampling Comparisons Between MonoTrap and Sampling Tube

This technical note shows the differences in analysis by using two different sampling medias: MonoTrap RGC18 TD and Sampling tube (TenaxTA 150 g).

The method used this time showed better sensitivity for low boiling point components, such as Toluene and Xylene, when using sampling tube. On the other hand, MonoTrap showed better sensitivity for hydrocarbons, such as Hexadecane and the medium to high-boiling components (Methylbenzothiazole and Phenanthrene). Especially when placed on the hairbrush, the MonoTrap sensitivity was higher.

When using sampling tube, it is possible to sampling the entire amount of volatilized compounds in Tedlar Bag. Therefore, it could deliver a good sensitivity for easily volatilized compounds. On the contrary, as MonoTrap can be put very close to the sample, it can be used to achieve higher sensitivity of those compounds with low volatility.

Sampling Preparation

<Sampling with MonoTrap>

Hairbrush
↓
Sampling MonoTrap RGC18 TD
↓
HandyTD / GC/MS

Place RGC18 (i)* on the hairbrush and put into Tedlar bag.
Place another RGC18 (ii)* at a distance from the hair brush.
Remove the air from the bag with an air pump.
Add nitrogen 1 L.

Collect headspace gas overnight at room temperature

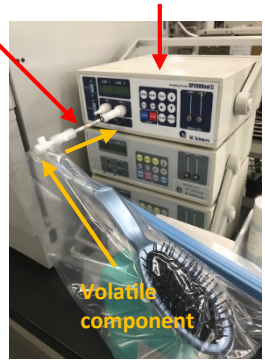
* RGC18 (i) is in contact with the hairbrushes
RGC18 (ii) is not in contact with hairbrushes

<Sampling with sampling tube>

Hairbrush
↓
Sampling TenaxTA
↓
HandyTD / GC/MS

Place a hairbrush in a tedrag bag
Remove air from the pump
Add 1 L

Allow to stand at room temperature overnight to volatilize the volatile components
Connect the collection tube to the sampling pump
Connect Tedra Bags behind Collection Tubes
Collect 1 L (100 mL/min) with sampling pumps



※ Volatile constituents in Tedra bags sampled
Be aspirated by pumps and collected in the TenaxTA

System Requirements

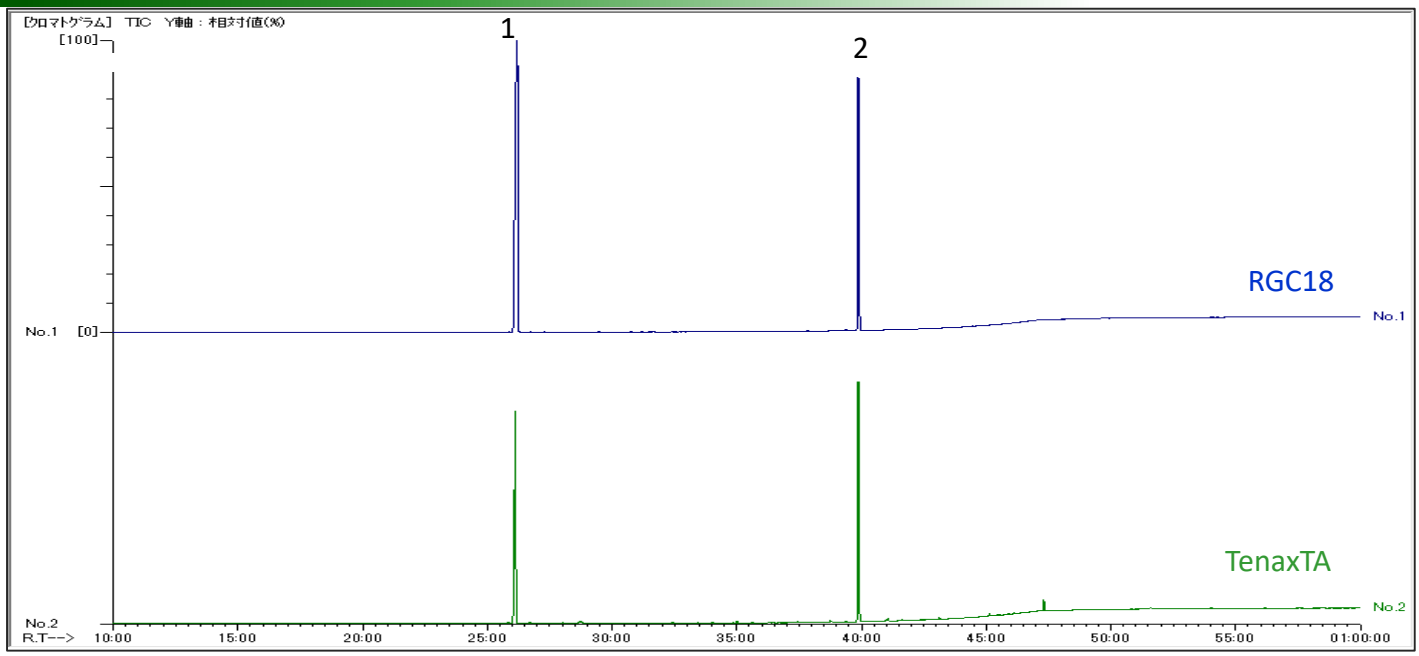
GC/MS Conditions

System	: Thermal Desorption-GC/MS (HandyTD TD265)
Column	: InertCap Pure-WAX (0.25 mm I.D. × 60 m, df = 0.5 µm)
Col. Cat. No.	: 1010-68164
Col. Temp.	: 40 ℃(5 min) - 5 ℃/min - 250 ℃
Carrier Gas	: He, 1 mL/min (constant flow)
GC Inlet	: 250 ℃ Split 10:1
Detection	: MS Scan (*m/z* 30-350)

HandyTD Conditions

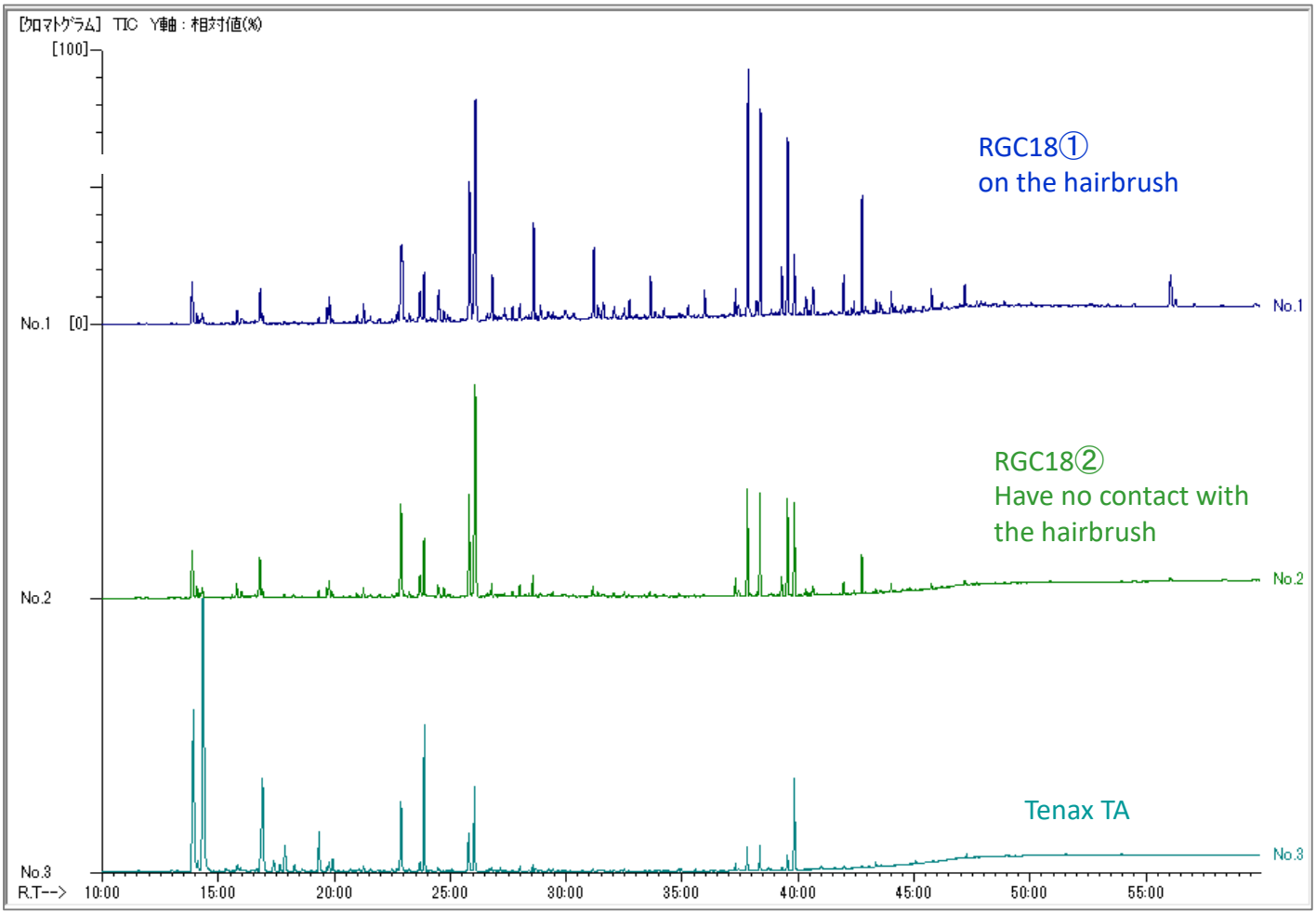
Desorb Temp.	: Room temperature(0.1 min) - 45 ℃/sec- 250 ℃(5 min) ⇒MonoTrap
Pre Desorb Press.	: Room temperature(1 min) - 45 ℃/sec- 270 ℃(5 min) ⇒Tenax TA : 140 kPa

Comparison of Operating Blanks

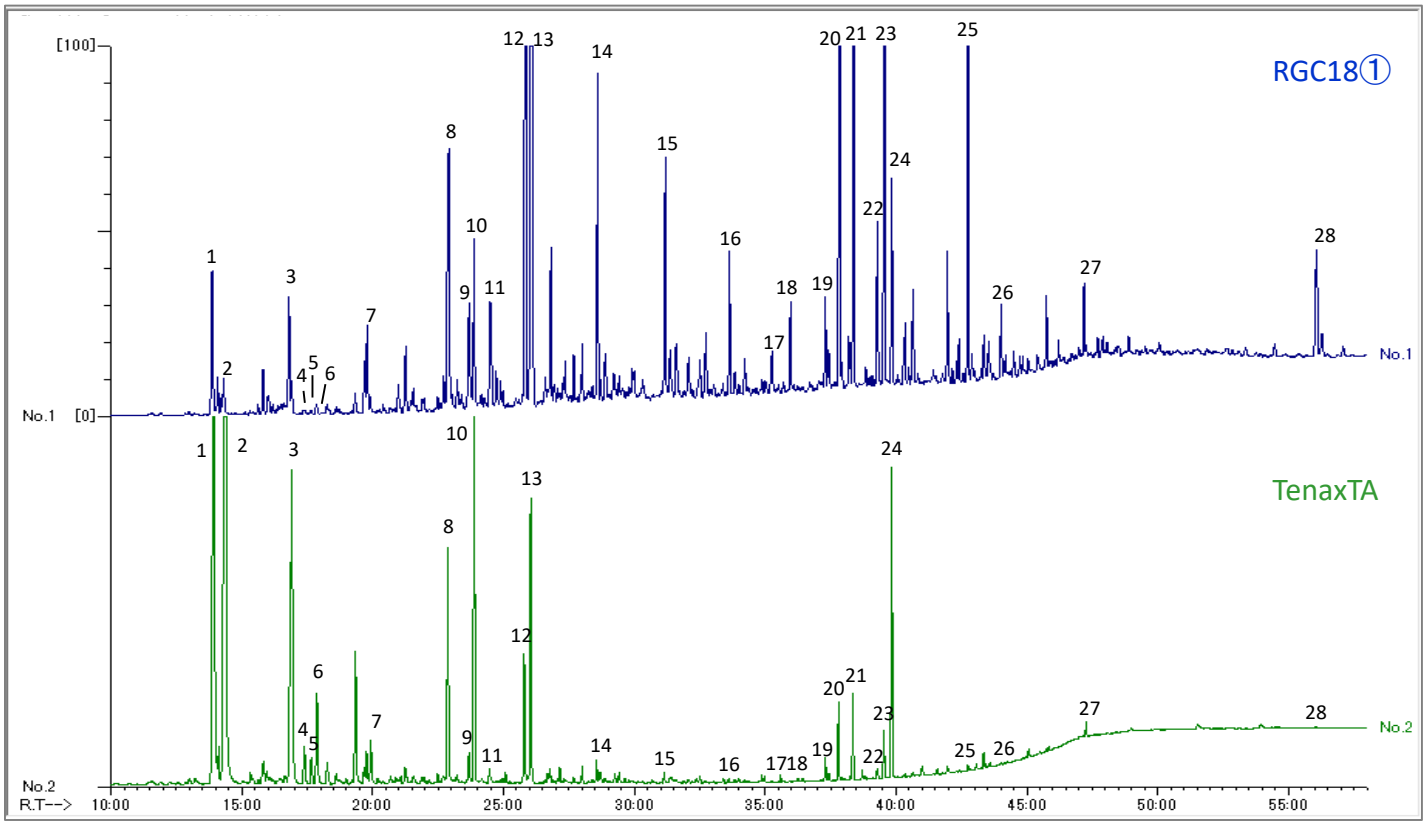


* 1, Dimethylacetamide; 2, Phenol, ingredients from tedra bags.

Comparison of Analysis Result



Analytical results (enlarged) of RGC18 (a) and TenaxTA.



No qualitative tests have been performed on standard samples.
Library search results.

1. Pinene
2. Toluene
3. Pinene
4. Ethylbenzene
5. Xylene
6. Xylene
7. Xylene
8. Cyclohexanone
9. Dimethyformamide
10. Methylstyrene
11. Acetonyldimethylcarbinol
12. Butoxyethanol
13. Dimethylacetamide*
14. Pentadecane
15. Hexadecane
16. Heptadecane
17. Teramethyl Hexadecane
18. Octadecane
19. Benzyl Alcohol
20. Propanoic acid, 2-methyl-, 1-(1,1-dimethylethyl) -2-methyl-1,3-propanediyl ester
21. Butylated Hydroxytoluene
22. Methylbenzothiazole
23. Benzothiazole
24. Phenol*
25. Acetone anil
26. Caprolactam
27. Fluorene
28. Phenanthrene

* This is an ingredient derived from a tedra bag.

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