

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

Using MonoTrap RGC18 TD and Sampling tube (TenaxTA 150 g) were used as sampling media to compare.

Following the analysis condition, it found sampling tube performed better sensitivity for low boiling point components, such as Toluene and Xylene. On the other hand, MonoTrap performed better sensitivity for hydrocarbons, such as Hexadecane and the medium to high-boiling components (Methylbenzothiazole and Phenanthrene). Especially when placed on the hairbrush, the sensitivity performed higher.

When using sampling tube, it is possible to sampling the entire amount of volatilized compounds in Tedlar Bag. Therefore, it could perform a good sensitivity for easily volatilized compounds.

When using MonoTrap, it can be sampling as a position close to the sample, therefore it is able to improve the sensitivities for difficult-to-analyze compounds.

## Sampling Preparation

### <Sampling with MonoTrap>

Place RGC18 (i)\* on the hairbrush and put into Tedlar bag.

Place another RGC18 (ii)\* at a distance from the hair brush. the hair brush is placed in the hair brush and the hair brush is removed from the hair brush and the hair is removed from the hair brush and the hair is removed from the hair brush.

Remove air from the pump

Add 1 L

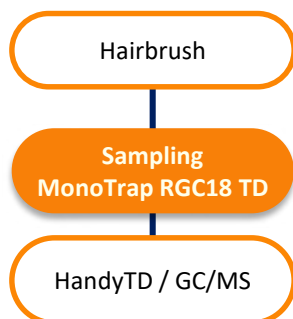
Collect headspace gas overnight at room temperature



RGC18 (ii)

RGC18 (i)

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



### <Sampling with sampling tube>

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

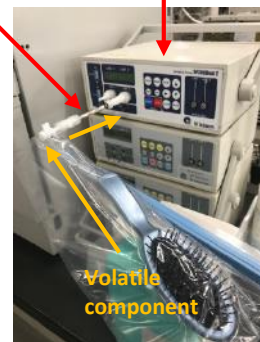
Connect the collection tube to the sampling pump

Connect Tedra Bags behind Collection Tubes

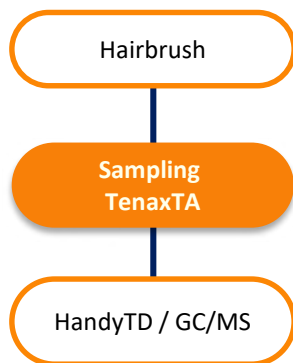
Collect 1 L (100 mL/min) with sampling pumps



TenaxTA Sampling pump



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



## System Requirements

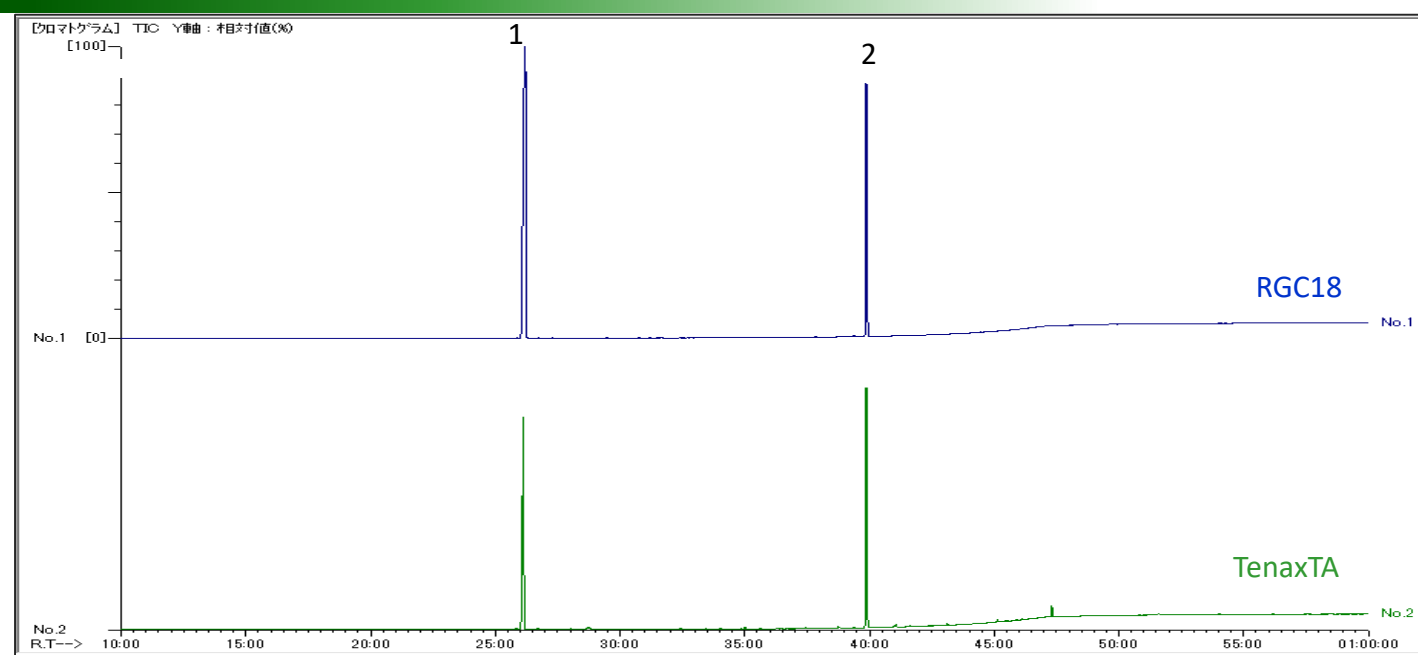
### GC/MS Conditions

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

### HandyTD Conditions

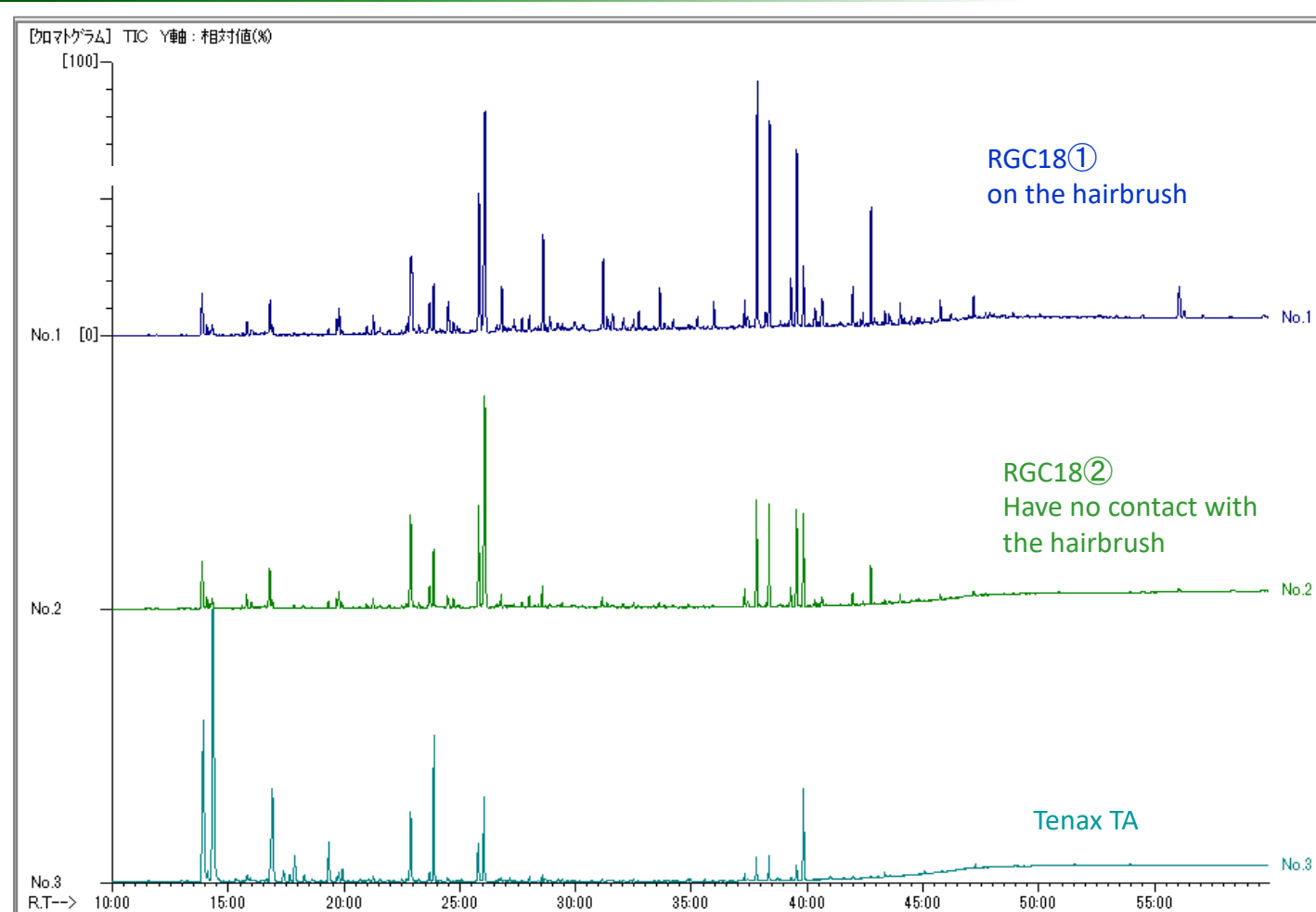
<b>Desorb Temp.</b>	: Room temperature(0.1 min) - 45 °C/sec- 250 °C(5 min) ⇒ MonoTrap
<b>Pre Desorb Press.</b>	: Room temperature(1 min) - 45 °C/sec- 270 °C(5 min) ⇒ Tenax TA : 140 kPa

## Comparison of Operating Blanks

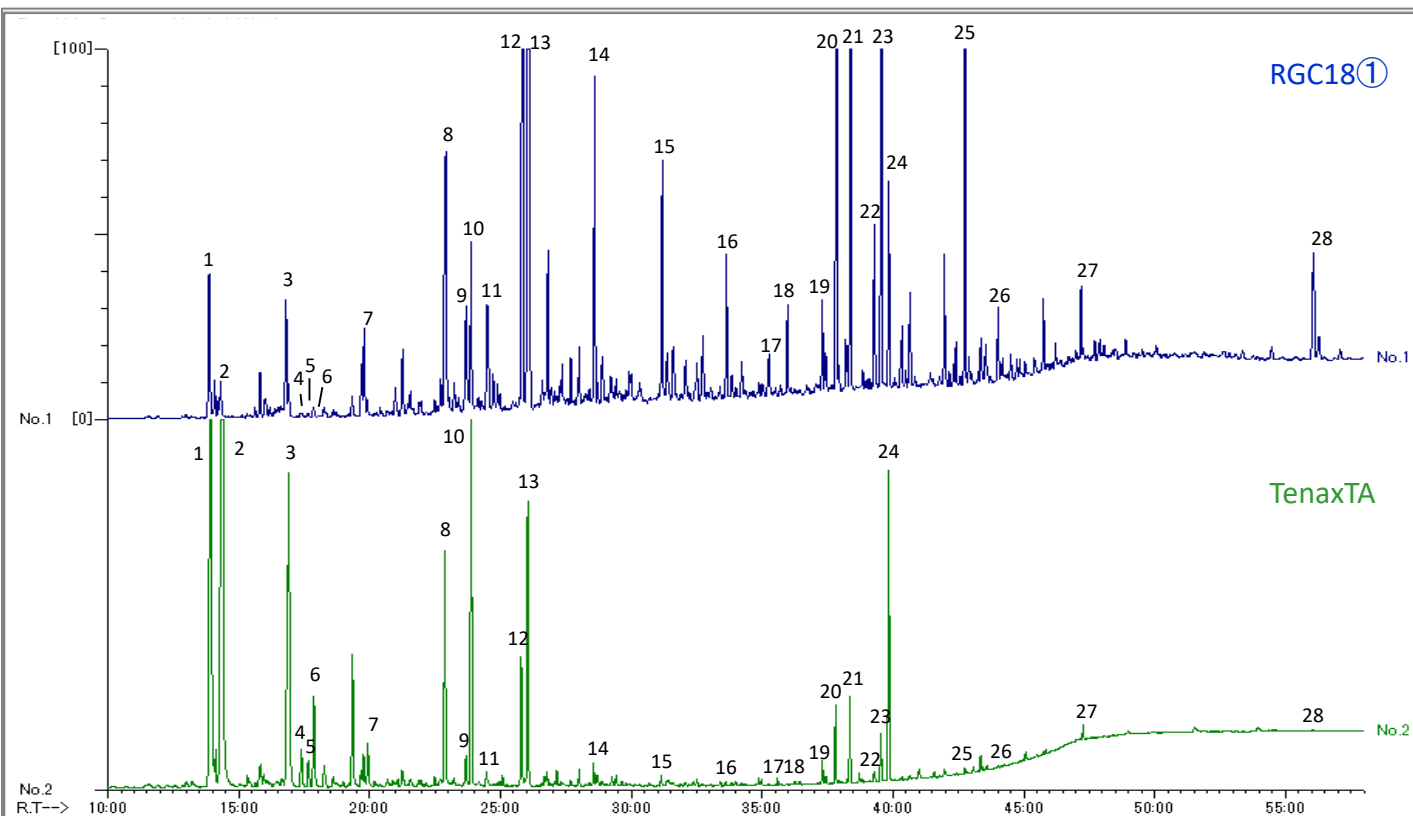


\* 1, Dimethylacetamide; 2, Phenol, ingredients from tetra bags.

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

\* This is an ingredient derived from a tetra bag.

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