

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

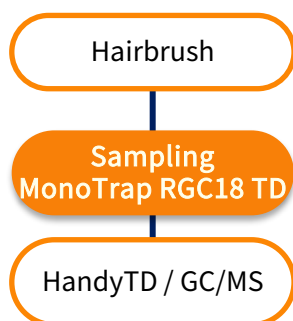
Using MonoTrap RGC18 TD and Sampling tube (TenaxTA 150 g) were used as sampling media to compare. Following the analysis condition, it found sampling tube performed better sensitivity for low boiling point components, such as Toluene and Xylene. On the other hand, MonoTrap performed better sensitivity 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

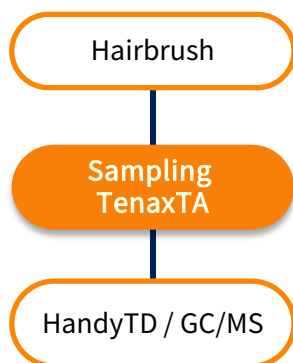
Add 1 L

Collect headspace gas overnight at room temperature



\* RGC18 (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

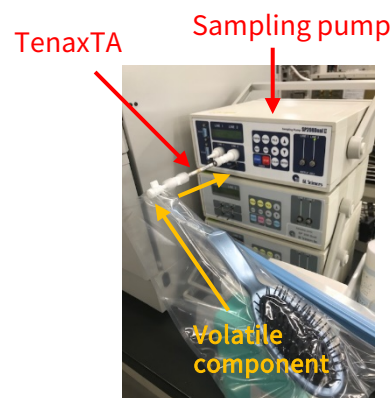
Add 1 L

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



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

## System Requirements

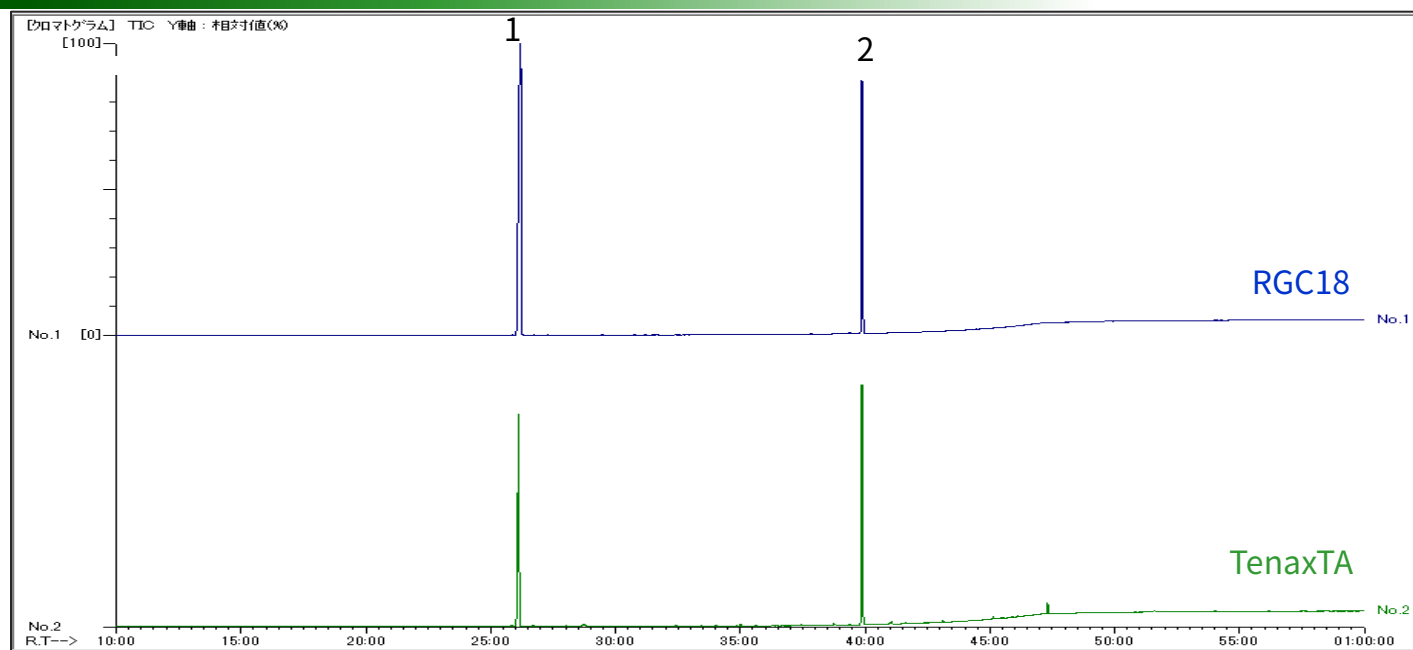
### GC/MS Conditions

**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 °C(5 min) - 5 °C/min - 250 °C  
**Carrier Gas** : He, 1 mL/min (constant flow)  
**GC Inlet** : 250 °C Split 10:1  
**Detection** : MS Scan (*m/z*30-350)

### HandyTD Conditions

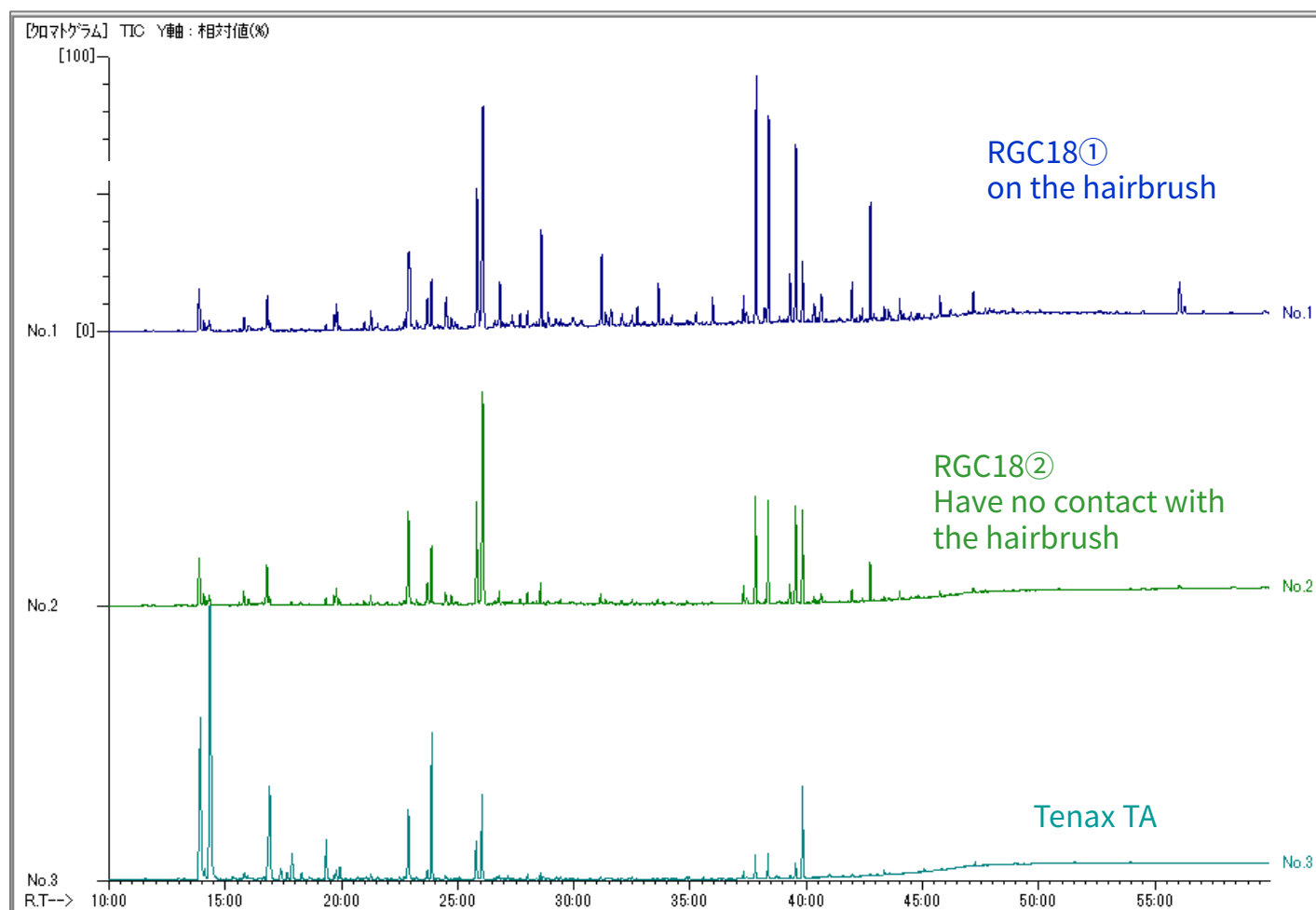
**Desorb Temp.** : Room temperature(0.1 min)  
 - 45 °C/sec- 250 °C(5 min) ⇒ MonoTrap  
**Pre Desorb Press.** : Room temperature(1 min)  
 - 45 °C/sec- 270 °C(5 min) ⇒ Tenax TA  
 : 140 kPa

## Comparison of Operating Blanks

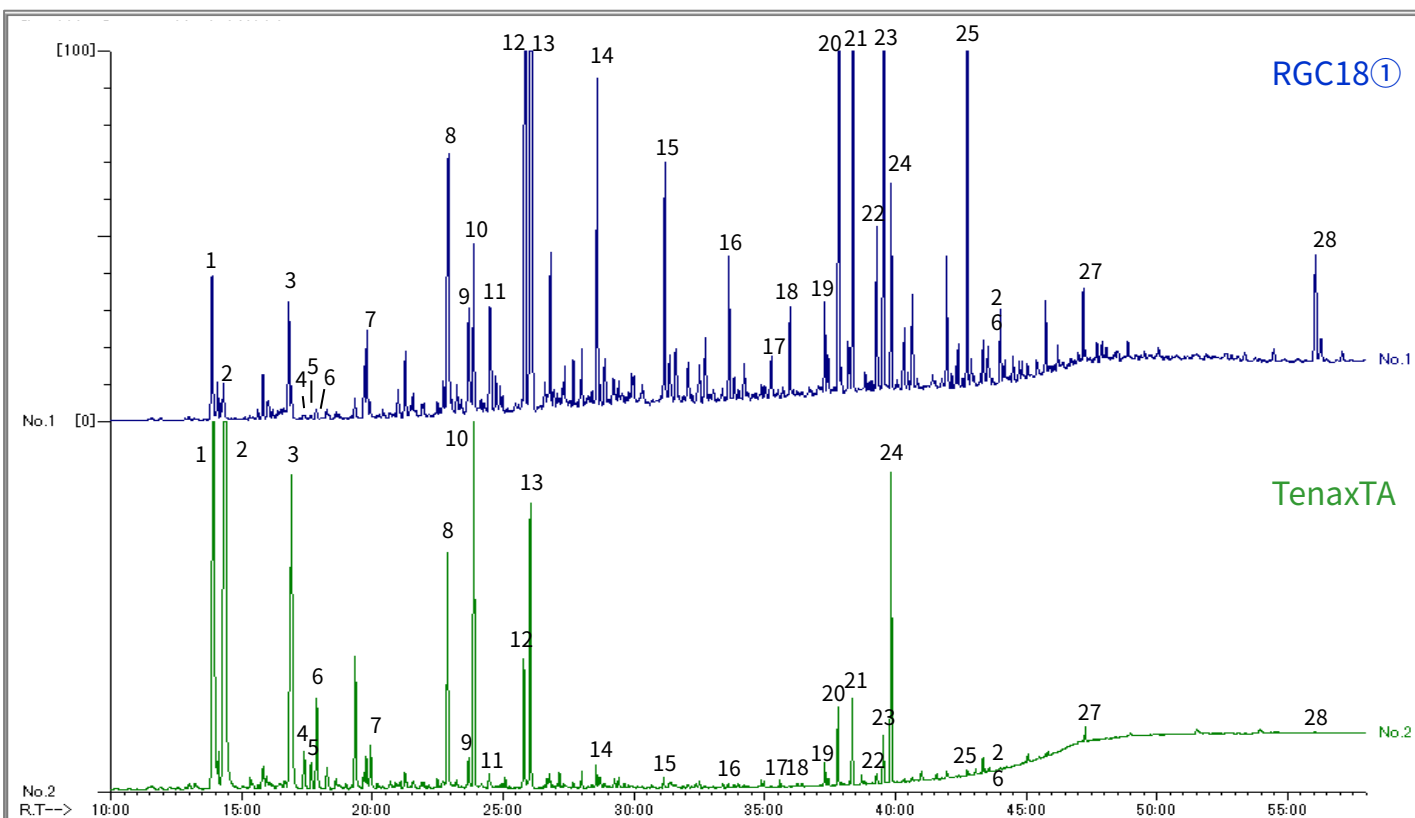


\* 1, Dimethylacetamide; 2, Phenol, ingredients from tedra bags.

## Comparison of Analysis Result



## Analytical results (enlarged) of RGC18 (a) and Tenax



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. Dimethylformamide
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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