

Analysis of Fragrances of Cosmetics using GC/MS

The 7th revision of the Cosmetics Directive was proposed in the European Union (EU) in March, 2003, and in that directive, the names of 26 compounds deemed to be allergens contained in cosmetics were published. If any of those compounds are contained in concentrations of 10ppm and 100ppm or greater in leave-on and rinse-off products, respectively, their content must be displayed. This also applies to cosmetics imported into the EU.

These substances are terpene alcohols, aldehydes and esters, etc. That list is shown in Table 2, and analysis for these substances is conducted using GC/MS.

Introduced here is an example of analysis of a standard solution containing these substances.

This investigation was performed in cooperation with Takasago International Corporation.

Table 1 shows the analytical conditions. Silicon and WAX columns were investigated, however, the results introduced here were obtained using a WAX column. The mass numbers used in the SIM analysis are summarized in Table 2.

Fig.1 shows the TIC chromatogram. Overlapping occurs at 2 locations, however, quantitation can be performed without problem using the MC or SIM.

Table 1 Analytical Conditions

-GC-	Inj.Temp.	: 230°C
Column : Stabilwax 30m × 0.25mm I.D. df=0.25µm	Injection Method	: Split
Col.Temp. : 50°C-15°C/min-100°C-5°C/min-250°C(10min)	Split Ratio	: 1 : 40
Carrier Gas : He,45.0cm/sec;Constant Linear Velocity Mode	Injection Volume	: 1µL
-MS-	Ionization	: EI
I.F. Temp. : 230°C	Scan Range	: 35-500
I.S. Temp. : 200°C	Scan Interval	: 0.5sec

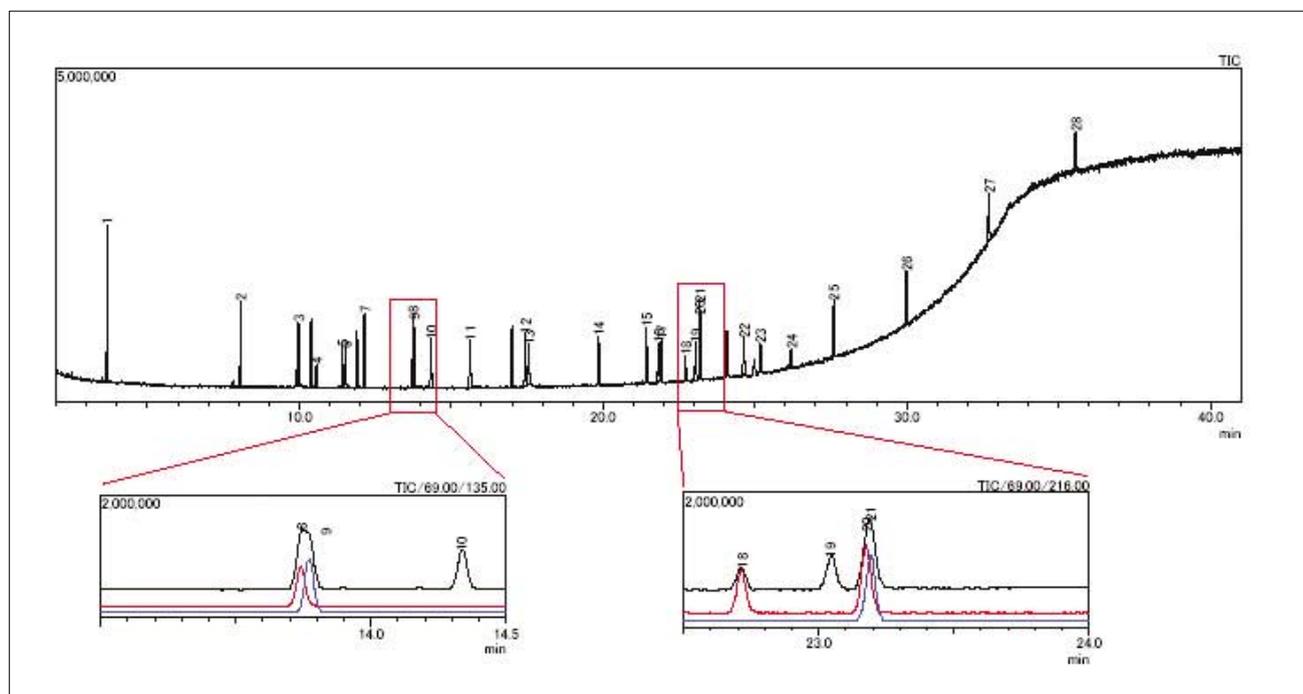


Fig.1 TIC of SCAN Mode (10ppm sample)

Table 2 Compound Name and SIM Mass Number

Peak No.	Compound Name	SIM Mass Number		
1	Limonene	68.00	67.00	93.00
2	Linalool	93.00	71.00	121.00
3	Methyl heptin carbonate	95.00	79.00	123.00
4	Citral 1	69.00	94.00	109.00
5	1,4-dibromobenzene (IS)	236.00	234.00	238.00
6	Citral 2	69.00	94.00	109.00
7	Citronellol	69.00	81.00	95.00
8	Geraniol	69.00	41.00	123.00
9	3-Methyl-4-(2,6,6-trimethyl-2-cyclohexen-1-yl)-3-buten-2-one	135.00	206.00	150.00
10	Benzyl alcohol	108.00	79.00	107.00
11	Hydroxy-citronellal	59.00	43.00	71.00
12	Cinnamal	131.00	132.00	103.00
13	Hydroxy-methylpentyl-cyclohexenecarboxaldehyde	189.00	147.00	204.00

Peak No.	Compound Name	SIM Mass Number		
14	Eugenol	164.00	149.00	103.00
15	Amyl cinnamal	202.00	129.00	201.00
16	Anisyl alcohol	138.00	109.00	137.00
17	Cinnamyl alcohol	92.00	115.00	134.00
18	Farnesol 1	69.00	81.00	93.00
19	Isoeugenol	164.00	149.00	131.00
20	Farnesol 2	69.00	81.00	93.00
21	Hexyl cinnam-aldehyde	216.00	129.00	215.00
22	Coumarin	146.00	118.00	89.00
23	2-(4-tert-Butylbenzyl)propionaldehyde	136.00	149.00	192.00
24	Amylcinnamyl alcohol	115.00	133.00	204.00
25	Benzyl benzoate	105.00	212.00	194.00
26	Benzyl salicylate	91.00	65.00	228.00
27	4,4'-Dibromobiphenyl (IS)	312.00	310.00	314.00
28	Benzyl cinnamate	131.00	192.00	193.00

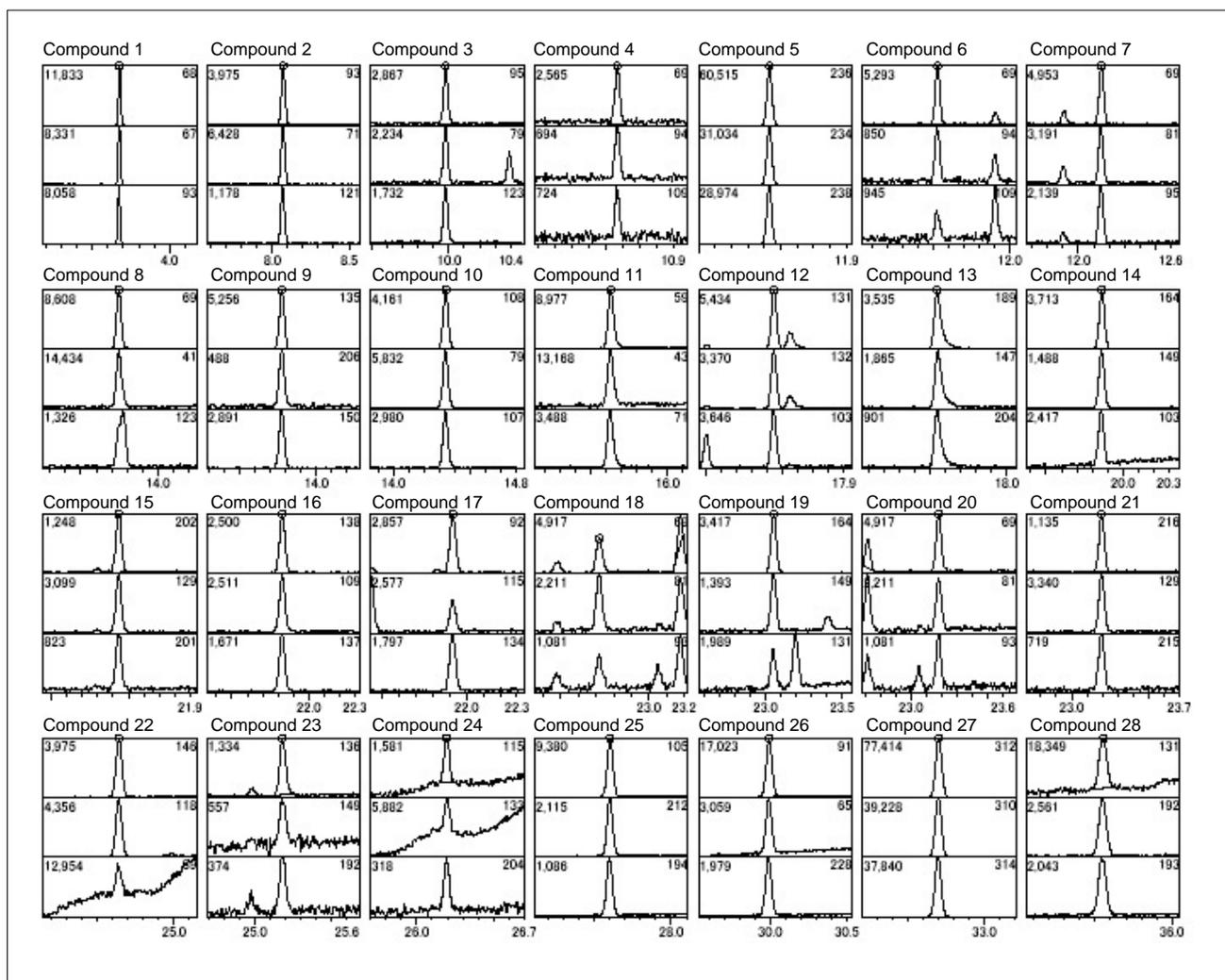


Fig.2 Mass Chromatograms of SIM Mode (0.5ppm samples)

Fig.2 shows the SIM chromatogram for each compound. The concentration of each compound is 0.5ppm. From this data, it is clear that detection

sensitivity is sufficient for analysis of the regulation concentration of 10ppm. For inquiries regarding this sheet, please contact Shimadzu Corporation.



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