SHIMADZU APPLICATION NEWS

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY No.L230

Analysis of Cosmetics

The cosmetics we use in our everyday life are supposed "to be applied or spread to our body or to be used by similar methods so as to keep our body clean, beautiful, more attractive, change image of our looks, or to keep our skin or hair healthy, and to bring on a rather mild effect to our body" by the definition of the Drugs, Cosmetics and Medical Instruments Act (Ordinance No.145, 1960). Disinfectants and antiseptics, if used in quantity in the raw materials for such cosmetics as lotions and creams, may adversely affect our health, and for these reasons it has become necessary to examine the quality of the raw materials of such cosmetics by some strict means.

Introduced in this article are analyses as well as pretreatment for effective components contained in the most commonly used cosmetics including hair tonics (2 kinds), medicinal treatment creams, and medicinal shampoos.

■ Analysis for Glycyrrhizic Acid and Piroctone in Shampoo

Introduced here is an analysis for glycyrrhizic acid and piroctone in a commercial shampoo. In order to reduce influence of metallic ion coordination of pirocetone on the peak shape, it is recommended to preliminarily wash the flow path and syringe with EDTA2Na (ethylenediaminetetraacetic acid disodium salt) so as to prevent influence on metal by contamination at the time of separation.

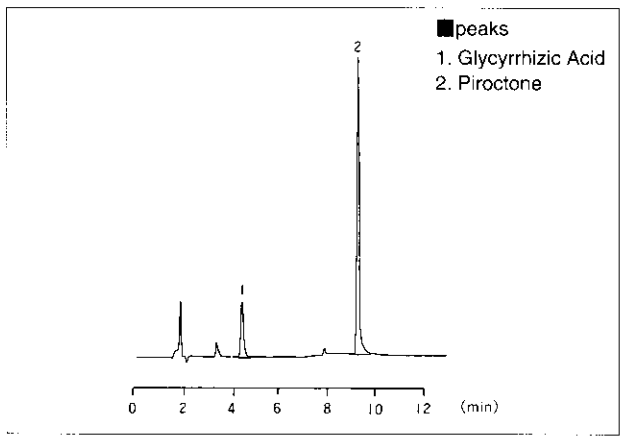

Fig.1 Analysis of a Commercial Shampoo

Table 1 Sample Treatment

Weigh sample 200 300mg
↓
Add 50mL of 10mM HClaq Containing 2mM EDTA. 2Na/methanol=1/1
↓
Ultrasonication for 5min
↓
Keep at 60°C for 10min
↓
Shake Vigorously
↓
Filtration
↓
Injection of 10 μL

Table 2 Anaytical Conditions

Column	:	L-Column ODS (4.6mm ID × 150mmL)
Mobile Phase	:	Gradient Program A→B
	A :	10mM (Sodium) Phosphate (pH2.6) Conditioning 0.1mM EDTA. 2Na/Acetonitrile=4/1
	B :	10mM (Sodium) Phosphate (pH2.6) Containing 0.2mM EDTA. 2Na/Acetonitrile=1/3
Flow Rate	:	1.0mL/min
Temperature	:	40°C
Detection	:	SPD-10A 250nm RESPONSE ; 4 AUXRANGE ; 3 Atten 7 (change to 8 at 6min)

Time Program

#	TIME	FUNC	VALUE
0	3.00	B.CONC	40.0
1	6.00	WAVE A	300
2	10.00	B.CONC	100.0
3	15.00	B.CONC	100.0
4	15.01	B.CONC	40.0
5	20.90	WAVE A	250
6	21.00	ZERO A	
7	22.00	STOP	

■ Analysis for Allantoin in Medicated Skin Treatment Cream

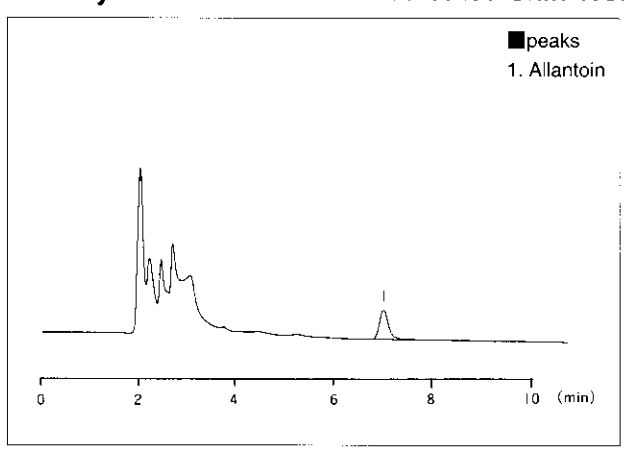

Fig.2 Chromatogram of Allantoin

Table 3 Sample Pretreatment

Weigh sample 200—300mg
↓
Add 50mL of water
↓
Ultrasonication for 5min
↓
Keep at 60°C for 10min
↓
Shake vigorously
↓
Filtration
↓
Injection of 10 μL

Table 4 Analytical Conditions

Column	:	Asahipak NH2P-50 (4.6mm ID × 250mmL)
Mobile Phase	:	10mM (Sodium) Phosphate (pH2.6) /Acetonitrile=1/4
Flow Rate	:	1.0mL/min
Temperature	:	40°C
Detection	:	SPD-10A 200nm RESPONSE ; 4 AUXRANGE ; 3 Atten 6

■ Analysis of a Hair Lotion

Introduced here are analyses of two kinds of hair lotions (A and B). As hinokitiol contained in lotion A is also characteristic of metal ion coordination, it needs to be handled carefully in the same way as the aforementioned analysis of piroctone. Swertiamarin in lotion B is an effective component in an extract of Japanese green gentian.

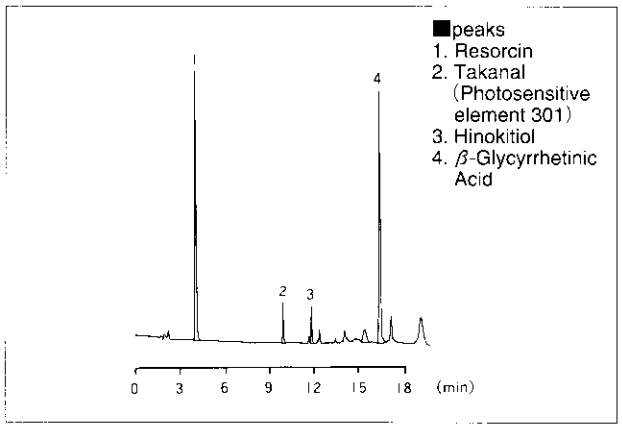

Fig.3 Analysis of Hair Lotion A

Table 5 Sample Pretreatment

Hair Lotion A was Diluted 20—fold with Methanol
/2mM EDTA. 2Na=7/3
↓
Filtration
↓
Injection of 10 μL

Table 6 Analytical Conditions

Column	: L-Column ODS
	(4.6mm ID × 150mmL)
Mobile Phase	: Gradient Program A →B
	A : 10mM (Sodium) Phosphate (pH2.6)
	Containing 0.1mM EDTA. 2Na/Acetonitrile=6/1
	B : 10mM (Sodium) Phosphate (pH2.6)
	Containing 0.2mM EDTA. 2Na/Acetonitrile=1/3
Flow Rate	: 1.0mL/min
Temperature	: 40°C
Detection	: SPD-10A 275nm
	RESPONSE ; 4 AUXRANGE ; 2
	Atten 7

Time Program

#	TIME	FUNC	VALUE
0	2.00	B.CONC	0.0
1	6.00	WAVE A	400
2	10.00	B.CONC	100.0
3	11.50	WAVE A	260
4	16.00	B.CONC	100.0
5	16.01	B.CONC	0.0
6	20.80	WAVE A	275
7	21.00	ZERO A	
8	22.00	STOP	

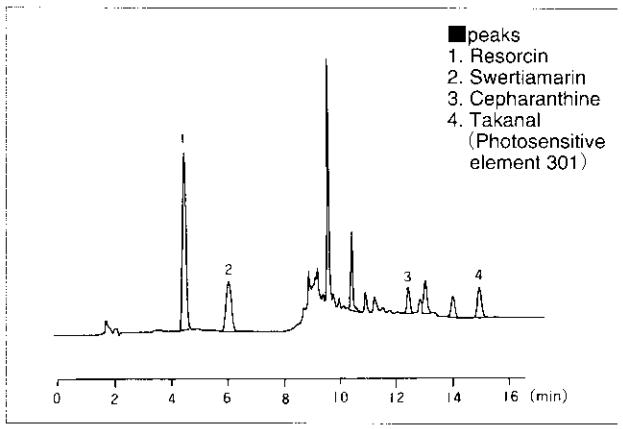

Fig.4 Analysis of Hair Lotion B

Table 7 Sample Pretreatment

Hair Lotion B was Diluted 5 fold with Methanol
↓
Filtration
↓
Injection of 10 μL

Table 8 Analytical Conditions

Column	: L-Column ODS
	(4.6mm ID × 150mmL)
Mobile Phase	: Gradient Program A95%→B70%
	A : 10mM (Sodium) Phosphate (pH2.6)
	Containing 100mM $NaClO_4$/Acetonitrile=10/1
	B : 10mM (Sodium) Phosphate (pH2.6)
	Containing 100mM $NaClO_4$/Acetonitrile=1/1
Flow Rate	: 1.0mL/min
Temperature	: 40°C
Detection	: SPD-10A 240nm
	RESPONSE ; 4 AUXRANGE ; 2
	Atten 7

Time Program

#	TIME	FUNC	VALUE
0	4.90	B.CONC	5.0
1	5.00	B.CONC	70.0
2	7.00	WAVE A	220
3	14.50	WAVE A	370
4	16.00	B.CONC	70.0
5	16.10	B.CONC	5.0
6	20.40	WAVE A	240
7	21.50	ZERO A	
8	22.00	STOP	

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