

Date : January 31, 2019

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 19A18-PTH07-1-CC

Customer identification : Rose Absolute - Morocco - R30107810R

Type : Absolute

Source : *Rosa centifolia*

Customer : Plant Therapy

ANALYSIS

Method: PC-PA-014-17J19 - Analysis of the composition of an essential oil, or other volatile liquid, by FAST GC-FID (in French); identifications validated by GC-MS.

Analyst : Sylvain Mercier, M. Sc., Chimiste

Analysis date : January 29, 2019

Checked and approved by :

Alexis St-Gelais, M. Sc., chimiste 2013-174

Note: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.

This report is digitally signed, it is only considered valid if the digital signature is intact.

PHYSICOCHEMICAL DATA

Physical aspect: Orange viscous liquid

Refractive index: 1.4938 ± 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method. The unidentified fraction of the oil consists of several unknown weakly volatile compounds, that are characteristic of rose absolutes (the main peak is reported). Reader is invited to consider the percentage on DB-5 in priority, since some compounds are fully retained on DB-Wax and affect the reported percentage.

ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
Ethanol	0.01	0.02	Aliphatic alcohol
Hexanol	0.01	0.01	Aliphatic alcohol
Heptanal	0.01	tr	Aliphatic aldehyde
α -Pinene	0.01	0.01	Monoterpene
Benzaldehyde	0.02	0.02	Simple phenolic
β -Pinene	0.01*	0.01	Monoterpene
Sabinene	[0.01]*	tr	Monoterpene
Myrcene	0.02	0.03	Monoterpene
Limonene	0.01	0.01	Monoterpene
Benzyl alcohol	0.09	0.26	Simple phenolic
(<i>E</i>)- β -Ocimene	0.01	0.01	Monoterpene
α -Phenylethanol	0.09	0.62*	Simple phenolic
<i>cis</i> -Sabinene hydrate	0.01	0.01	Monoterpenic alcohol
Linalool	0.01	0.02	Monoterpenic alcohol
Phenylethyl alcohol	35.11*	44.85	Simple phenolic
<i>cis</i> -Rose oxide	[35.11]*	0.01	Monoterpenic ether
Phenylethyl formate	0.02	0.04	Phenolic ester
Terpinen-4-ol	0.01	0.01	Monoterpenic alcohol
Nerol	0.36	[0.62]*	Monoterpenic alcohol
Citronellol	10.37	12.02	Monoterpenic alcohol
Neral	[10.37]	0.06*	Monoterpenic aldehyde
(<i>Z</i>)-Isogeraniol	0.02	0.02	Monoterpenic alcohol
Geraniol	6.52	7.23	Monoterpenic alcohol
Geranial	0.10	0.09	Monoterpenic aldehyde
Citronellyl acetate	0.77*	[0.06]*	Monoterpenic ester
Eugenol	[0.77]*	1.00*	Phenylpropanoid
Geranic acid	0.13	0.10	Aliphatic acid
Geranyl acetate	0.04	0.06	Monoterpenic ester
Methyleugenol	0.09	0.98	Phenylpropanoid
β -Caryophyllene	0.16	0.20*	Sesquiterpene
α -Guaiene	0.04	[0.20]*	Sesquiterpene
α -Humulene	0.07	0.09	Sesquiterpene
Germacrene D	0.08	0.09*	Sesquiterpene
Aciphyllene	0.03	[0.09]*	Sesquiterpene
δ -Guaiene	0.03	0.03	Sesquiterpene
Pentadecane	0.02	0.02	Alkane
γ -Cadinene	0.03	0.12*	Sesquiterpene
δ -Cadinene	0.02	0.03	Sesquiterpene
α -Elemol	0.04	0.06	Sesquiterpenic alcohol
Phenylethyl tiglate	0.01	0.01	Phenolic ester
Hexadecane	0.01	tr	Alkane
β -Eudesmol	0.02	0.04	Sesquiterpenic alcohol
Phenylethyl hexanoate	0.02		Phenolic ester
(<i>2E,6Z</i>)-Farnesol	0.03	0.02	Sesquiterpenic alcohol
Heptadecane	0.11	[0.12]*	Alkane
(<i>2E,6E</i>)-Farnesol	0.11	0.19	Sesquiterpenic alcohol
Benzyl benzoate	0.02	0.05	Phenolic ester
Octadecane	0.03	0.02	Alkane

Phenylethyl benzoate	0.02	0.02	Phenolic ester
(9Z)-Nonadecene	0.26	0.31	Alkene
Nonadecane	0.36	0.43	Alkane
Palmitic acid	0.50	0.64	Aliphatic acid
(9Z)-Eicosene	0.05	0.03	Alkene
Eicosane	0.03	0.01	Alkane
(10Z)-Heneicosene	0.03	[1.00]*	Alkene
Heneicosane	0.07	[1.00]*	Alkane
Citronellyl caprate	0.01	0.02	Monoterpenic ester
Geranyl caprate	0.99		Monoterpenic ester
Phenylethyl undecanoate?	0.58		Phenolic ester
Ethyl linoleate	0.16	0.18	Aliphatic ester
Ethyl oleate	0.18*	0.06	Aliphatic ester
Ethyl linolenate	[0.18]*	0.15	Aliphatic ester
Tricosane	0.06	0.04	Alkane
Citronellyl laurate	0.05		Monoterpenic ester
Tetradecyl octanoate	0.09		Aliphatic ester
Tetradecyl nonanoate	0.05		Aliphatic ester
Pentadecyl octanoate	0.11		Aliphatic ester
Phenylethyl myristate	0.05		Phenolic ester
Citronellyl myristate	0.02		Monoterpenic ester
Geranyl myristate	0.03		Monoterpenic ester
Unknown	0.04		Phenolic ester
Unknown	0.09		Phenolic ester
Phenylethyl palmitoleate?	0.19		Phenolic ester
Phenylethyl palmitate	0.14		Phenolic ester
Citronellyl palmitoleate?	0.09		Monoterpenic ester
Geranyl palmitoleate?	0.03		Monoterpenic ester
Citronellyl palmitate	0.11		Monoterpenic ester
Geranyl palmitate	0.08		Monoterpenic ester
α-Tocopherol	0.14		Tocopherol
Unknown	2.42		Oxygenated triterpene
Total identified	59.21%	70.37%	

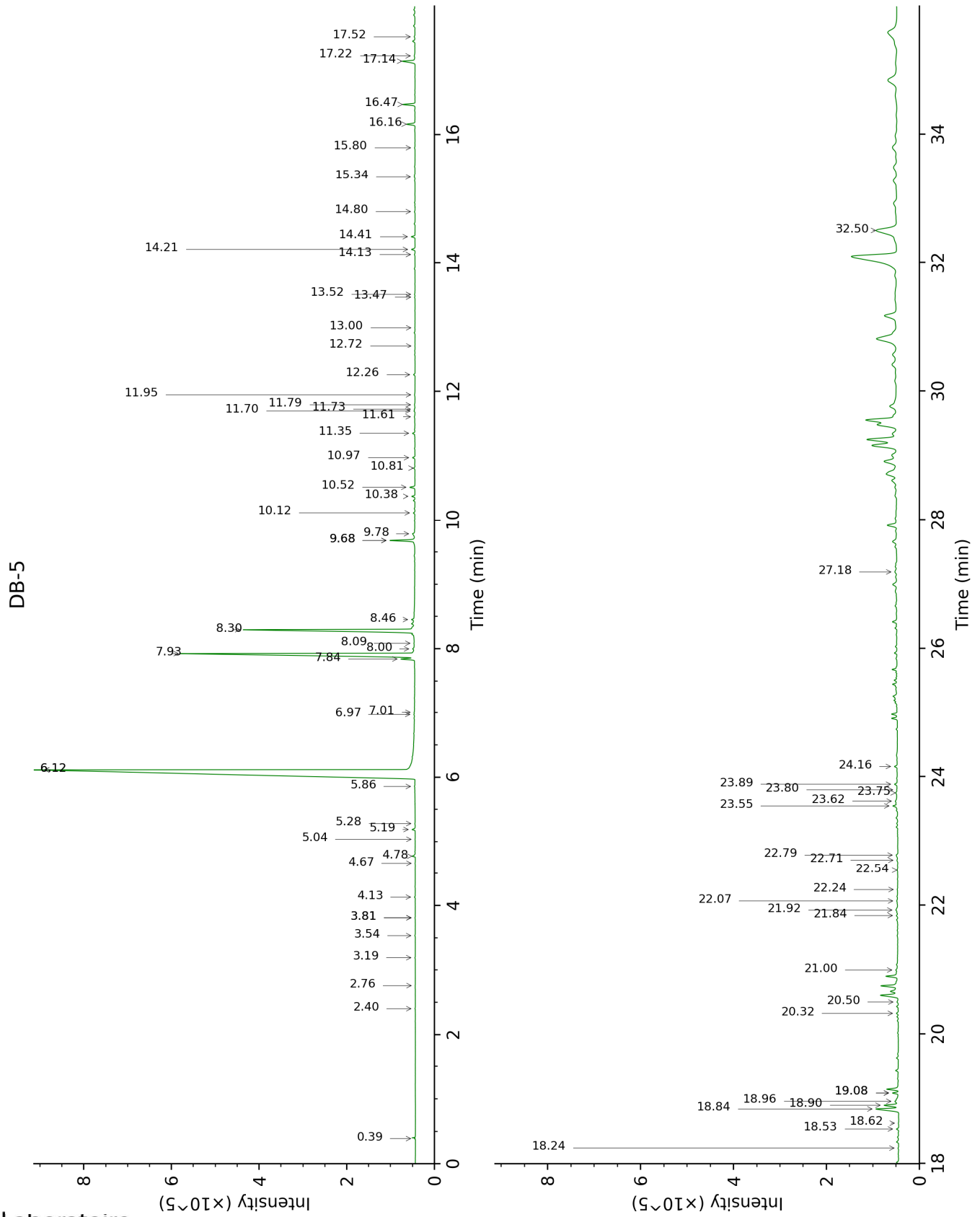
*: Two or more compounds are coeluting on this column

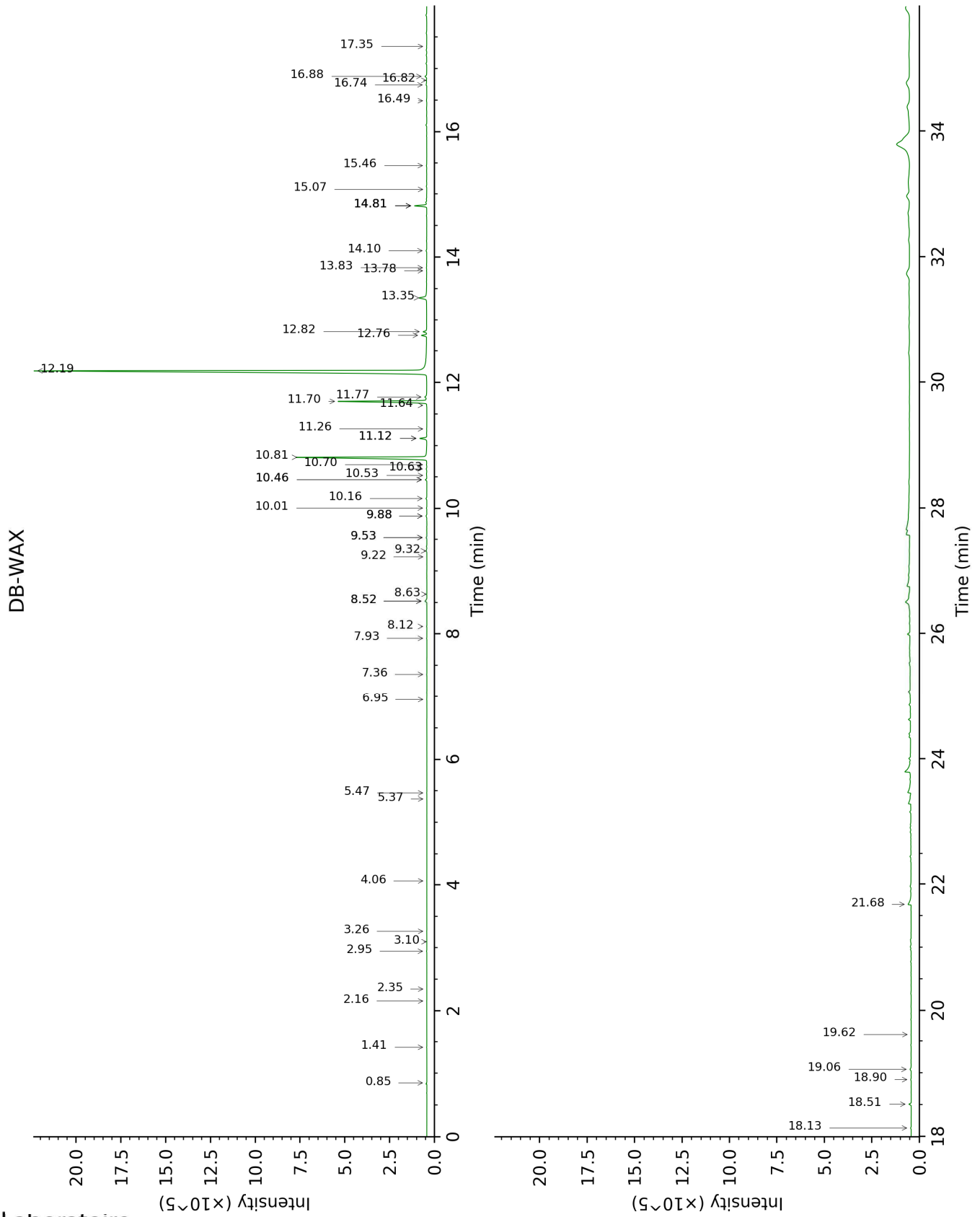
[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

This page was intentionally left blank. The following pages present the complete data of the analysis.





FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Ethanol	0.39	513	0.01	0.85	912	0.02
Hexanol	2.40	871	0.01	5.47	1319	0.01
Heptanal	2.76	900	0.01	3.10	1146	tr
α -Pinene	3.19	929	0.01	1.41	993	0.01
Benzaldehyde	3.54	952	0.02	7.36	1458	0.02
β -Pinene	3.81*	970	0.01	2.16	1067	0.01
Sabinene	3.81*	970	[0.01]	2.35	1085	tr
Myrcene	4.13	991	0.02	2.95	1134	0.03
Limonene	4.67	1025	0.01	3.26	1159	0.01
Benzyl alcohol	4.78	1032	0.09	11.77	1816	0.26
(<i>E</i>)- β -Ocimene	5.04	1049	0.01	4.06	1222	0.01
α -Phenylethanol	5.19	1058	0.09	11.12*	1759	0.62
<i>cis</i> -Sabinene hydrate	5.28	1064	0.01	6.95	1428	0.01
Linalool	5.86	1100	0.01	8.12	1516	0.02
Phenylethyl alcohol	6.12*	1117	35.11	12.19	1853	44.85
<i>cis</i> -Rose oxide	6.12*	1117	[35.11]	5.37	1312	0.01
Phenylethyl formate	6.98	1172	0.02	10.70	1724	0.04
Terpinen-4-ol	7.01	1175	0.01	8.63	1556	0.01
Nerol	7.84	1230	0.36	11.12*	1759	[0.62]
Citronellol	7.93†	1236	10.37	10.81	1734	12.02
Neral	8.00†	1241	[10.37]	9.53*	1627	0.06
(<i>Z</i>)-Isogeraniol	8.09	1247	0.02	11.26	1772	0.02
Geraniol	8.30	1261	6.52	11.70	1810	7.23
Geranial	8.46	1272	0.10	10.16	1679	0.09
Citronellyl acetate	9.68*	1354	0.77	9.53*	1627	[0.06]
Eugenol	9.68*	1354	[0.77]	14.82*	2099	1.00
Geranic acid	9.78	1362	0.13	16.74	2296	0.10
Geranyl acetate	10.12	1385	0.04	10.63	1718	0.06
Methyleugenol	10.38	1404	0.09	13.35	1959	0.98
β -Caryophyllene	10.52	1414	0.16	8.52*	1547	0.20
α -Guaiene	10.81	1436	0.04	8.52*	1547	[0.20]
α -Humulene	10.97	1448	0.07	9.32	1610	0.09
Germacrene D	11.35	1477	0.08	9.88*	1656	0.09
Aciphyllene	11.61	1496	0.03	9.88*	1656	[0.09]
δ -Guaiene	11.70	1502	0.03	10.01	1666	0.03
Pentadecane	11.73	1505	0.02	7.93	1501	0.02
γ -Cadinene	11.79	1510	0.03	10.46*	1703	0.12
δ -Cadinene	11.95	1522	0.02	10.53	1709	0.03
α -Elemol	12.26	1547	0.04	14.10	2030	0.06
Phenylethyl tiglate	12.72	1583	0.01	15.07	2125	0.01
Hexadecane	13.00	1605	0.01	9.22	1602	tr

β-Eudesmol	13.47	1644	0.02	15.46	2164	0.04
Phenylethyl hexanoate	13.52	1648	0.02			
(2E,6Z)-Farnesol	14.13	1699	0.03	16.49	2270	0.02
Heptadecane	14.21	1706	0.11	10.46*	1703	[0.12]
(2E,6E)-Farnesol	14.41	1723	0.11	16.88	2311	0.19
Benzyl benzoate	14.80	1756	0.02	18.90	2535	0.05
Octadecane	15.34	1803	0.03	11.64	1804	0.02
Phenylethyl benzoate	15.80	1845	0.02	19.62	2620	0.02
(9Z)-Nonadecene	16.16	1878	0.26	12.82	1910	0.31
Nonadecane	16.47	1906	0.36	12.76	1904	0.43
Palmitic acid	17.14	1970	0.50	21.68	2875	0.64
(9Z)-Eicosene	17.22	1978	0.05	13.83	2004	0.03
Eicosane	17.52	2006	0.03	13.78	1999	0.01
(10Z)-Heneicosene	18.24	2078	0.03	14.82*	2099	[1.00]
Heneicosane	18.53	2107	0.07	14.82*	2099	[1.00]
Citronellyl caprate	18.62	2116	0.01	17.35	2362	0.02
Geranyl caprate	18.84	2138	0.99			
Phenylethyl undecanoate?	18.90	2144	0.58			
Ethyl linoleate	18.96	2151	0.16	18.51	2490	0.18
Ethyl oleate	19.08*	2164	0.18	18.13	2448	0.06
Ethyl linolenate	19.08*	2164	[0.18]	19.06	2554	0.15
Tricosane	20.32	2296	0.06	16.82	2304	0.04
Citronellyl laurate	20.50	2315	0.05			
Tetradecyl octanoate	21.00	2370	0.09			
Tetradecyl nonanoate	21.84	2467	0.05			
Pentadecyl octanoate	21.92	2477	0.11			
Phenylethyl myristate	22.06	2493	0.05			
Citronellyl myristate	22.24	2514	0.02			
Geranyl myristate	22.54	2550	0.03			
Unknown [m/z 105, 79 (23), 104 (16), 67 (12), 95 (12), 106 (9)... 382 (1)]	22.71	2570	0.04			
Unknown [m/z 105, 104 (21), 67 (13), 81 (11)]	22.79	2579	0.09			

106 (9)... 384 (1)]				
Phenylethyl palmitoleate?	23.55	2673	0.19	
Phenylethyl palmitate	23.62	2683	0.14	
Citronellyl palmitoleate?	23.75	2699	0.09	
Geranyl palmitoleate?	23.80	2704	0.03	
Citronellyl palmitate	23.88	2716	0.11	
Geranyl palmitate	24.16	2751	0.08	
α-Tocopherol	27.18	3136	0.14	
Unknown [m/z 109, 69 (43), 95 (41), 43 (27), 205 (25)... 424 (11)...]	32.50	3496	2.42	
Total identified		59.21%		70.37%
Total reported		61.76%		70.37%

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

†: Peaks apexes were resolved, but peaks overlapped and were summed for analysis

tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

R.T.: Retention time (minutes)

R.I.: Retention index