

Date : September 29, 2015

SAMPLE IDENTIFICATION

Internal code : 15I15-NGA2-1-HM

Customer identification : Helichrysum italicum ssp serotinum - #FR-152589

Type : Essential Oil

Source : *Helichrysum italicum* ssp. *serotinum*

Customer : Nature's Gift Aromatherapy

ANALYSIS

Method : PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

Analyst : Alexis St-Gelais, M. Sc.

Analysis date : 2015-09-16

IDENTIFIED COMPOUNDS

Identification	Colonne: BP5			Colonne: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
2-Pentanone	0.63	643	0.10				Aliphatic ketone
2-Methyl-3-pentanone	0.89	736	0.26	0.27	952	0.91	Aliphatic ketone
4-Methyl-3-hexanone	1.67	836	0.57	0.59	1036	1.45	Aliphatic ketone
α -Thujene	2.71	920	0.01	2.69	985	1.06*	Monoterpene
α -Pinene	2.80	926	2.55	[2.69]	985	1.06*	Monoterpene
α -Fenchene	3.04*	940	0.75	0.48	1017	1.29	Monoterpene
Camphene	3.04*	940	[0.75]	0.22	1024	1.34	Monoterpene
β -Pinene	3.51	971	0.76	0.80	1063	1.69	Monoterpene
Myrcene	3.82*	991	0.16	0.09	1134	2.44	Monoterpene
<i>trans</i> -Dehydroxylinalool oxide	3.82*	991	[0.16]	0.07	1175	2.95	Monoterp. ether
6-Methyl-5-hepten-2-one	3.89	995	0.01	0.02	1300	4.72	Aliphatic ketone
α -Phellandrene	4.05	1005	0.04	0.04	1125	2.33	Monoterpene
Mentha-1,5,8-triene?	4.08	1006	0.09				Monoterpene
<i>cis</i> -Dehydroxylinalool oxide?	4.19	1013	0.01				Monoterp. ether
<i>cis</i> -Hex-3-en-1-yl acetate	4.21	1014	0.02	0.02	1284	4.48	Aliphatic ester
α -Terpinene	4.23	1015	0.22	0.21	1139	2.50	Monoterpene
Limonene	4.47*	1029	5.84	5.73	1159	2.75	Monoterpene
para-Cymene	4.47*	1029	[5.84]	0.28	1228	3.67	Monoterpene
1,8-Cineole	4.51	1031	0.85	0.79	1163	2.80	Monoterp. ether
<i>cis</i> - β -Ocimene	4.65	1039	0.08	0.94	1206	3.36*	Monoterpene
<i>trans</i> - β -Ocimene	4.83	1049	0.19	0.20	1220	3.56	Monoterpene
Isobutyl angelate	4.95	1056	0.14	0.16	1256	4.08	Aliphatic ester
γ -Terpinene	4.99	1058	0.88	[0.94]	1206	3.36*	Monoterpene
Terpinolene	5.44	1084	0.22	0.23	1240	3.84	Monoterpene
Fenchone	5.56	1091	0.02	0.01	1340	5.31	Monoterp. ketone
Isobutyl tiglate	5.65	1096	0.01	0.01	1311	4.89	Aliphatic ester
2,4-Dimethyl-heptane-3,5-dione	5.71	1099	0.30	3.11	1485	7.98*	β -Diketone
Unknown (m/z = 81, 41 (96), 69 (74), 123 (57), 109 (56), 83 (53)... 137 (28)... 152 (4))	5.79	1103	0.29				Oxygenated monoterp.
2-Methylbutyl 2-methylbutyrate	5.84	1105	0.11	0.11	1252	4.02	Aliphatic ester
Linalool	5.92	1109	1.55	1.70	1516	8.83	Monoterp. alcohol
Nonanal	5.98	1112	0.28	0.30	1352	5.49	Monoterp. aldehyde
endo-Fenchol	6.21	1122	0.04	0.06	1532	9.35	Monoterp. alcohol
Isoamyl angelate	6.83*	1150	0.69	0.52	1360	5.62	Aliphatic ester
Camphor	6.83*	1150	[0.69]	0.01	1449	7.24	Monoterp. ketone

Nerol oxide	6.87	1153	0.04				Monoterp. ether
Borneol	7.37	1175	0.06	0.06	1643	13.61	Monoterp. alcohol
Terpinen-4-ol	7.52	1182	0.55	0.57	1545	9.77	Monoterp. alcohol
Dimethyl octanedione isomer	7.62	1187	0.48	0.49	1553	10.04	β-Diketone
4,6-Dimethyl-3,5-octanedione	7.67	1189	0.72	0.36	1556	10.13	β-Diketone
α-Terpineol	8.06	1204	0.62	0.60	1641	13.53	Monoterp. alcohol
Nerol	9.01	1230	2.79	3.07	1751	19.47	Monoterp. alcohol
Neral	9.60	1246	0.15				Monoterp. aldehyde
Isoitalicene	14.73*	1355	0.73	0.62	1442	7.09*	Sesquiterpene
α-Copaene	14.73*	1355	[0.73]	[0.62]	1442	7.09*	Sesquiterpene
Neryl acetate	15.50	1368	33.45	35.22	1688	15.76*	Monoterp. ester
Italicene	16.50	1386	2.84	[3.11]	1485	7.98*	Sesquiterpene
Hexyl hexanoate	16.98	1394	0.21	0.18	1605	11.81	Aliphatic ester
β-Caryophyllene	17.27	1399	0.11	0.11	1529	9.24	Sesquiterpene
cis-α-Bergamotene	17.42	1401	0.35	0.43	1521	8.97	Sesquiterpene
trans-α-Bergamotene	18.71	1418	0.24	0.21	1535	9.45	Sesquiterpene
Italidione I	19.93	1434	4.23	7.74	1823	24.19*	β-Diketone
α-Humulene	20.45	1441	0.25	0.20	1601	11.62	Sesquiterpene
Neryl propionate	21.37	1453	4.99	5.22	1744	19.03	Monoterp. ester
γ-Curcumene	22.50*	1468	11.94	12.55	1639	13.41*	Sesquiterpene
Italidione isomer	22.50*	1468	[11.94]	[7.74]	1823	24.19*	β-Diketone
ar-Curcumene	22.85	1473	2.62	2.68	1713	17.11	Sesquiterpene
α-Selinene	22.92*	1474	1.85	[12.55]	1639	13.41*	Sesquiterpene
β-Selinene	22.92*	1474	[1.85]	[12.55]	1639	13.41*	Sesquiterpene
Italidione II	23.24	1478	2.15	[7.74]	1823	24.19*	β-Diketone
β-Bisabolene	24.72*	1497	0.27	0.04	1667	14.74	Sesquiterpene
β-Curcumene	24.72*	1497	[0.27]	0.05	1673	15.04	Sesquiterpene
γ-Cadinene	24.72*	1497	[0.27]	[35.22]	1688	15.76*	Sesquiterpene
Italidione II isomer	24.95*	1500	0.70	[7.74]	1823	24.19*	β-Diketone
δ-Cadinene	24.95*	1500	[0.70]	[35.22]	1688	15.76*	Sesquiterpene
trans-γ-Bisabolene	26.08	1514	0.15	0.04	1698	16.23	Sesquiterpene
β-Sesquiphellandrene	26.30	1516	0.10	0.09	1717	17.35	Sesquiterpene
Italicene ether?	27.65	1533	0.08				Sesquiterp. ether
Italidione III	30.21	1563	0.89	0.51	1829	24.64	β-Diketone
Italidione III isomer	30.75	1569	1.33				β-Diketone
Italidione III isomer III	31.19	1575	0.30				β-Diketone
Guaiol	32.31	1588	0.90	1.00	2016	36.12	Sesquiterp. alcohol
10-epi-γ-Eudesmol	32.91*	1595	1.54	0.08	2000	35.57	Sesquiterp. alcohol
Rosifolol?	32.91*	1595	[1.54]				Sesquiterp. alcohol
γ-Eudesmol	34.49	1624	0.74	0.77	2079	38.30	Sesquiterp. alcohol
β-Eudesmol	35.44	1644	1.07	0.70	2128	39.83	Sesquiterp. alcohol
Selin-11-en-4-α-ol	35.66	1649	0.23	0.05	2150	40.42	Sesquiterp. alcohol

Bulnesol	36.04	1657	0.18	0.20	2125	39.76	Sesquiterp. alcohol
Total identified	96.31%			93.50%			

*: Two or more compounds are coeluting on this column

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

Note: no correction factor was applied

OTHER DATA

Physical aspect : Yellow liquid

Refractive index : 1.4685 ± 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent were detected using this method.

Checked and approved by :

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

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