

Date : August 22, 2017

SAMPLE IDENTIFICATION

Internal code : 17H14-ROO1-1-DM

Customer identification : Lavender - Bulgaria - Batch #1

Type : Essential oil

Source : *Lavandula angustifolia*

Customer : Root

ANALYSIS

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

Identifications double-checked by GC-MS

Analyst : Sylvain Mercier, M. Sc., chimiste

Analysis date : 2017-08-22

Checked and approved by :

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

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IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Isovaleral	0.55	658	0.02				Aliphatic aldehyde
2-Methylbutyral	0.68	675	0.01				Aliphatic aldehyde
Hexan-2-ol	1.86	816	0.03				Aliphatic alcohol
Methyl hexyl ether	1.93	822	0.19	0.18	847	0.83	Aliphatic ether
<i>cis</i> -Hex-3-en-1-ol	2.51	866	0.03	0.99	1333	5.78*	Aliphatic alcohol
Hexanol	2.72	882	0.12	0.22	1302	5.29	Aliphatic alcohol
Tricyclene	3.24	916	0.02				Aliphatic alcohol
α -Thujene	3.32	921	0.09	0.14	957	1.27	Monoterpene
α -Pinene	3.43	927	0.20	0.13	945	1.22	Monoterpene
Camphene	3.72*	944	0.18	0.04	1005	1.62	Monoterpene
α -Fenchene	3.72*	944	[0.18]	0.14	994	1.53	Monoterpene
Sabinene	4.15	969	0.05	0.05	1060	2.08	Monoterpene
β -Pinene	4.21	973	0.06	0.04	1041	1.91	Monoterpene
Myrcene	4.49	990	0.55	0.50	1115	2.68*	Monoterpene
Octan-3-one	4.54*	993	2.53	1.95	1203	3.80	Aliphatic ketone
Octen-3-ol	4.54*	993	[2.53]	0.25	1401	6.92	Aliphatic alcohol
Butyl butyrate	4.70	1002	0.14				Aliphatic ester
Δ 3-Carene	4.77*	1005	0.15	0.11	1093	2.40	Monoterpene
α -Phellandrene	4.77*	1005	[0.15]	[0.50]	1115	2.68*	Monoterpene
Octan-3-ol	4.82	1008	0.48	0.53	1347	6.00	Aliphatic alcohol
α -Terpinene	4.95	1016	0.03	[0.50]	1115	2.68*	Monoterpene
Hexyl acetate	5.01	1019	0.81	0.92	1225	4.14*	Aliphatic ester
para-Cymene	5.15	1026	0.16	3.46	1207	3.86*	Monoterpene
Limonene	5.18	1028	0.42	1.62	1146	3.07*	Monoterpene
β -Phellandrene	5.21	1030	0.39	[1.62]	1146	3.07*	Monoterpene
1,8-Cineole	5.25	1031	0.87	[1.62]	1146	3.07*	Monoterp. ether
<i>cis</i> - β -Ocimene	5.37	1038	3.14	3.02	1192	3.64*	Monoterpene
<i>trans</i> - β -Ocimene	5.55	1048	2.80	[3.46]	1207	3.86*	Monoterpene
γ -Terpinene	5.73	1058	0.13	[3.02]	1192	3.64*	Monoterpene
<i>cis</i> -Linalool oxide (fur.)	6.02	1073	0.11	0.11	1381	6.54	Monoterp. alcohol
<i>cis</i> -Sabinene hydrate	6.08	1077	0.07	0.20	1406	7.05*	Monoterp. alcohol
Terpinolene	6.21	1084	0.08	[0.92]	1225	4.14*	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	6.34	1091	0.09	[0.20]	1406	7.05*	Monoterp. alcohol
para-Cymenene	6.43	1096	0.01	0.50	1370	6.36*	Monoterpene
Linalool	6.85*	1112	34.08	32.58	1502	9.46*	Monoterp. alcohol
Octen-3-yl acetate	6.85*	1112	[34.08]	[0.99]	1333	5.78*	Aliphatic ester
Octan-3-yl acetate	7.07	1120	0.25	0.28	1294	5.17	Aliphatic ester
<i>cis</i> -para-Menth-2-en-1-ol	7.25	1126	0.03	[32.58]	1502	9.46*	Monoterp. alcohol
Camphor	7.80	1146	0.28	0.26	1425	7.49	Monoterp. ketone
Lavandulol	8.39	1168	1.02	6.09	1619	14.14*	Monoterp. alcohol
Borneol	8.68	1178	0.76	[6.09]	1619	14.14*	Monoterp. alcohol

Terpinen-4-ol	8.87	1185	3.06	3.26	1530	10.48*	Monoterp. alcohol
Hexyl butyrate	9.21*	1197	0.83	[0.50]	1370	6.36*	Aliphatic ester
Cryptone	9.21*	1197	[0.83]	0.21	1564	11.75	Monoterp. ketone
α-Terpineol	9.52	1204	0.89	1.20	1623	14.36*	Monoterp. alcohol
Bornyl formate	10.39	1224	0.06	0.06	1456	8.23	Monoterp. ester
Nerol	10.68	1230	0.15				Monoterp. alcohol
Linalyl acetate	11.64	1251	29.22	30.13	1511	9.75	Monoterp. ester
Geraniol	11.91	1257	0.39	0.44	1782	23.99	Monoterp. alcohol
iso-Isopulegyl acetate	12.96	1280	0.13	[3.26]	1530	10.48*	Monoterp. ester
Lavandulyl acetate	13.31	1288	3.41	3.45	1552	11.29	Monoterp. ester
α-Cubebene	16.03	1332	0.05	[0.20]	1406	7.05*	Sesquiterpene
α-Terpinyl acetate	16.62	1341	0.02	[1.20]	1623	14.36*	Monoterp. ester
Neryl acetate	17.91	1360	0.25	0.32	1661	16.37*	Monoterp. ester
β-Elementene	18.95	1376	0.09	4.00	1525	10.30*	Sesquiterpene
Geranyl acetate	19.42	1383	0.42	0.49	1695	18.13	Monoterp. ester
Hexyl hexanoate	19.89	1390	0.11	0.15	1585	12.55*	Aliphatic ester
β-Caryophyllene	20.71	1402	4.10	[4.00]	1525	10.30*	Sesquiterpene
α-Santalene	21.03	1405	0.36	0.33	1517	10.00	Sesquiterpene
Aromadendrene	22.21	1419	0.11	[3.26]	1530	10.48*	Sesquiterpene
α-Humulene	23.45	1434	0.12	[0.15]	1585	12.55*	Sesquiterpene
allo-Aromadendrene	24.14	1442	0.10	0.08	1561	11.63	Sesquiterpene
trans-β-Farnesene	24.65	1449	3.76	[6.09]	1619	14.14*	Sesquiterpene
Germacrene D	25.69	1461	0.64	[1.20]	1623	14.36*	Sesquiterpene
γ-Cadinene	28.75	1497	0.09	0.20	1671	16.94*	Sesquiterpene
β-Bisabolene	28.90	1499	0.04	[0.32]	1661	16.37*	Sesquiterpene
trans-γ-Bisabolene	30.27	1519	0.03	[0.20]	1671	16.94*	Sesquiterpene
Caryophyllene oxide	33.87	1569	0.34	0.29	1845	28.52	Sesquiterp. ether
τ-Cadinol	37.56	1638	0.05	0.07	2070	39.38	Sesquiterp. alcohol
Total identified			99.20%	98.99%			

*: 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

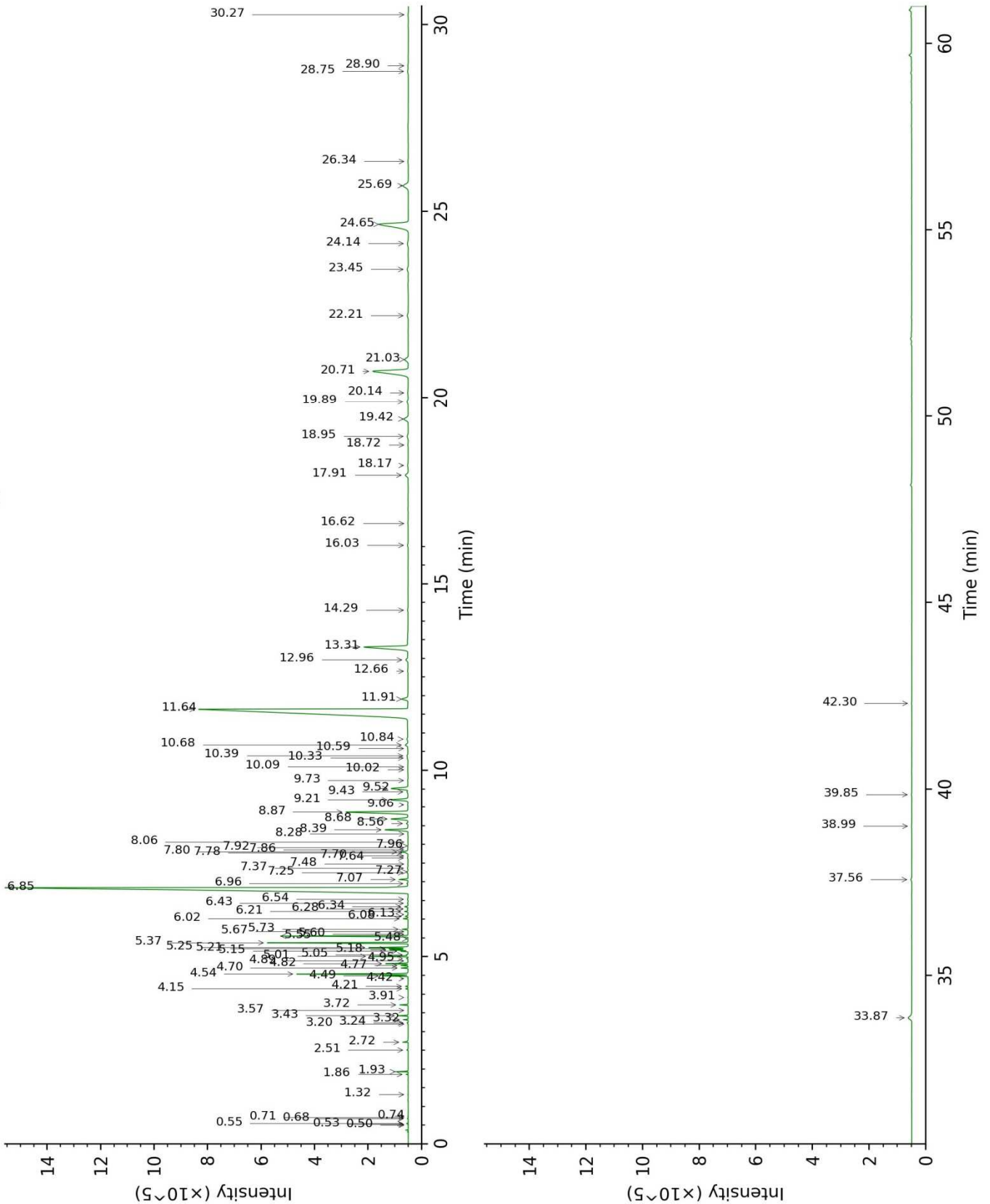
Physical aspect : Clear liquid

Refractive index : 1.4590 ± 0.0003 (20 °C)

CONCLUSION

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

17H14-ROO1-1-DM_BP5



17H14-ROO1-1-DM_WAX

