

Analysis Marjoram Essential Oil

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Date : March 31, 2017

SAMPLE IDENTIFICATION

Internal code : 17C27-FSE5-1-DM

Customer identification : Marjoram - Lot #99AB12324158

Type : Essential oil

Source : *Origanum marjorana*

Customer : Flowers Shining Everywhere Inc.

ANALYSIS

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

Analyst : Sylvain Mercier, M. Sc., chimiste

Analysis date : 2017-03-30

Checked and approved by :

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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.	
<i>cis</i> -Hex-3-en-1-ol	2.47	864	0.02	0.02	1321	5.48	Aliphatic alcohol
<i>trans</i> -Hex-2-en-1-ol	2.65	878	0.01	0.01	1354	6.00	Aliphatic alcohol
Hashishene	3.20	916	0.01	0.71	941	1.15*	Monoterpene
α -Thujene	3.30	922	0.54	0.54	951	1.19	Monoterpene
α -Pinene	3.40	928	0.74	[0.71]	941	1.15*	Monoterpene
Sabinene	4.13	971	7.26	7.16	1057	1.98	Monoterpene
β -Pinene	4.19	974	0.42	0.40	1036	1.79	Monoterpene
Myrcene	4.46	991	2.05	1.98	1114	2.54	Monoterpene
Pseudolimonene	4.67	1003	0.06	0.06	1109	2.47	Monoterpene
α -Phellandrene	4.73	1006	0.30	0.28	1107	2.44	Monoterpene
α -Terpinene	4.94	1018	7.81	7.73	1122	2.65	Monoterpene
para-Cymene	5.10	1027	1.42	1.43	1206	3.76	Monoterpene
Limonene	5.15	1029	2.15	2.05	1139	2.86	Monoterpene
β -Phellandrene	5.18	1031	1.69	1.83	1145	2.94*	Monoterpene
1,8-Cineole	5.21	1033	0.11	[1.83]	1145	2.94*	Monoterp. ether
<i>cis</i> - β -Ocimene	5.32	1039	0.04	12.95	1190	3.53*	Monoterpene
<i>trans</i> - β -Ocimene	5.50	1049	0.05	0.06	1197	3.63	Monoterpene
γ -Terpinene	5.73	1061	12.99	[12.95]	1190	3.53*	Monoterpene
<i>cis</i> -Sabinene hydrate	6.01	1076	4.63	4.70	1406	6.82	Monoterp. alcohol
Terpinolene	6.18	1085	2.99	2.95	1222	3.99	Monoterpene
<i>trans</i> -Sabinene hydrate	6.67*	1108	18.21	17.41	1483	8.66	Monoterp. alcohol
Linalool	6.67*	1108	[18.21]	2.59	1493	8.90*	Monoterp. alcohol
<i>cis</i> -para-Menth-2-en-1-ol	7.14	1125	1.45	[2.59]	1493	8.90*	Monoterp. alcohol
<i>trans</i> -Pinocarveol	7.50	1139	0.06	0.05	1565	11.38	Monoterp. alcohol
<i>trans</i> -para-Menth-2-en-1-ol	7.63	1144	0.85	0.87	1553	10.94*	Monoterp. alcohol
δ -Terpineol	8.56	1178	0.06	0.06	1611	13.09	Monoterp. alcohol
Terpinen-4-ol	8.82	1187	22.57	22.75	1530	10.10	Monoterp. alcohol
<i>cis</i> -Sabinyl acetate	9.23	1201	0.28				Monoterp. ester
α -Terpineol	9.33	1203	3.36	3.29	1622	13.70	Monoterp. alcohol
<i>trans</i> -Piperitol	9.76	1213	0.46	0.45	1666	15.95	Monoterp. alcohol
Nerol	10.39	1227	0.06	0.06	1727	19.38	Monoterp. alcohol
Linalyl acetate	11.34	1248	2.32	2.36	1498	9.04*	Monoterp. ester
Geraniol	11.62	1254	0.07	0.07	1779	22.81	Monoterp. alcohol
Bornyl acetate	12.84	1281	0.14	[2.36]	1498	9.04*	Monoterp. ester
<i>trans</i> -Sabinyl acetate	13.47	1295	0.04	[0.87]	1553	10.94*	Monoterp. ester
δ -Terpinyl acetate	14.31	1310	0.02	0.09	1575	11.77*	Monoterp. ester
Carvacrol	15.54	1328	0.11	0.12	2121	40.36	Monoterp. alcohol
Neryl acetate	17.66	1360	0.04	0.03	1655	15.42	Monoterp. ester
Geranyl acetate	19.15	1383	0.07	0.11	1687	17.07	Monoterp. ester
β -Caryophyllene	20.41	1402	2.19	2.26	1518	9.61	Sesquiterpene
α -Humulene	23.10	1434	0.09	[0.09]	1575	11.77*	Sesquiterpene

Essential oil, *Origanum marjorana*
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Flowers Shining Everywhere Inc.

Bicyclogermacrene	26.55	1476	1.02	1.04	1637	14.43	Sesquiterpene
δ-Cadinene	28.97	1505	0.02	0.02	1673	16.33	Sesquiterpene
Caryophyllene oxide	33.48*	1568	0.13	0.07	1843	27.22	Sesquiterp. ether
Spathulenol	33.48*	1568	[0.13]	0.07	2015	37.00	Sesquiterp. alcohol
Total Identified		98.91%		98.63%			

*: 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 : Faintly yellow liquid

Refractive index : 1.4720 ± 0.0003 (20 °C)

CONCLUSION

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

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