

ANALYSIS Laurel Essential Oil

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Date : March 10, 2017

SAMPLE IDENTIFICATION

Internal code : 17B16-FSE31-1-DM

Customer identification : Laurel - Lot #HELN13216

Type : Essential oil

Source : *Laurus nobilis*

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).

• **Identifications** double-checked by GC-MS

Analyst : Sylvain Mercier, M. Sc., chimiste

Analysis date : 2017-03-01

Checked and approved by :

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Alexis St-Gelais, M. Sc., chimiste

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IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Ethyl 2-methylbutyrate	2.26	849	0.02	0.02	1002	1.56	Aliphatic ester
cis-Hex-3-en-1-ol	2.45	863	0.04	0.04	1320	5.61	Aliphatic alcohol
Hexanol	2.71	883	0.01	0.01	1296	5.22	Aliphatic alcohol
Tricyclene	3.21	917	0.01	0.01	919	1.08	Monoterpene
α -Thujene	3.30	922	0.45	0.50	956	1.24	Monoterpene
α -Pinene	3.31	928	4.15	3.99	947	1.20	Monoterpene
α -Fenchene	3.64*	945	0.32	0.03	987	1.43	Monoterpene
Camphene	3.68*	945	[0.32]	0.29	994	1.49	Monoterpene
Sabinene	4.13	971	8.23	8.06	1058	2.05	Monoterpene
β -Pinene	4.19	975	3.55	3.45	1038	1.86	Monoterpene
Myrcene	4.45*	990	0.86	0.78	1113	2.61	Monoterpene
Dehydro-1,8-cineole	4.45*	990	[0.86]	0.05	1127	2.80	Monoterp. ether
6-Methyl-5-hepten-2-one	4.53	995	0.02	0.02	1272	4.87	Aliphatic ketone
α -Octanol	4.66	1003	0.01	0.01	1350	6.10	Aliphatic alcohol
Δ^3 -Carene	4.72*	1006	0.36	0.23	1092	2.33	Monoterpene
α -Phellandrene	4.72*	1006	[0.36]	0.07	1106	2.52	Monoterpene
α -Terpinene	4.91	1012	0.42	0.38	1120	2.70	Monoterpene
1,8-Cineole	5.26*	1035	38.52	39.03	1150	3.11*	Monoterp. ether
Limonene	5.26*	1035	[38.52]	[39.03]	1150	3.11*	Monoterpene
para-Cymene	5.26*	1035	[38.52]	0.39	1205	3.85	Monoterpene
cis- β -Ocimene	5.32	1038	0.08	0.85	1186	3.57*	Monoterpene
trans- β -Ocimene	5.49	1048	0.19	0.19	1198	3.72*	Monoterpene
γ -Terpinene	5.68	1058	0.83	[0.85]	1186	3.57*	Monoterpene
cis-Sabinene hydrate	5.97	1074	0.30	0.30	1400	6.94	Monoterp. alcohol
Terpinolene	6.15	1084	0.25	0.24	1219	4.06	Monoterpene
Linalool	6.61*	1106	5.79	5.65	1491	9.16*	Monoterp. alcohol
trans-Sabinene hydrate	6.61*	1106	[5.79]	0.20	1474	8.75	Monoterp. alcohol
cis-para-Menth-2-en-1-ol	7.10	1124	0.07	[5.65]	1491	9.16*	Monoterp. alcohol
Camphor	7.58	1142	0.05	0.03	1420	7.42	Monoterp. ketone
trans-para-Menth-2-en-1-ol	7.68	1145	0.01	0.01	1566	11.97	Monoterp. alcohol
Borneol	8.41	1172	0.43	0.27	1611	13.88*	Monoterp. alcohol
Terpinen-4-ol	8.64	1180	1.69	1.67	1520	10.20	Monoterp. alcohol
α -Terpineol	9.24	1201	1.69	1.93	1616	14.11*	Monoterp. alcohol
γ -Terpineol	9.32	1203	0.09	0.06	1624	14.55	Monoterp. alcohol
Nerol	10.33	1226	0.21	0.21	1720	20.01	Monoterp. alcohol
Linalyl acetate	11.28	1247	0.21	0.22	1495	9.24	Monoterp. ester
Geraniol	11.60	1254	0.04	0.04	1771	23.46	Monoterp. alcohol
4-Thujen-2- α -yl acetate?	12.18	1267	0.11	0.08	1544	11.11	Monoterp. ester
Geranial	12.49	1273	0.03	0.02	1643	15.59	Monoterp. aldehyde
Bornyl acetate	12.78	1280	0.21	0.21	1498	9.36	Monoterp. ester
δ -Terpinyl acetate	14.40	1311	0.54	0.59	1561	11.76	Monoterp. ester

α -Cubebene	15.81	1332	0.04	0.04	1397	6.88	Sesquiterpene
α -Terpinyl acetate	16.61	1344	12.00	12.34	1613	13.85*	Monoterp. ester
Eugenol	17.13	1352	1.37	1.32	2050	38.86	Phenylpropanoid
β -Cubebene	18.18	1368	0.02	0.01	1466	8.56	Sesquiterpene
β -Elemene	18.69	1376	0.57	0.74	1512	9.92*	Sesquiterpene
Geranyl acetate	19.12	1383	0.03	0.03	1693	18.23	Monoterp. ester
β -Caryophyllene	20.34	1401	1.06	1.06	1509	9.80	Sesquiterpene
Methyleugenol	21.32	1413	5.50	5.44	1925	33.88*	Phenylpropanoid
α -Guaiene	21.86	1419	0.16	[0.74]	1512	9.92*	Sesquiterpene
α -Humulene	23.08	1434	0.17	0.32	1591	12.89	Sesquiterpene
allo-Aromadendrene	23.38	1437	0.11	0.09	1575	12.29	Sesquiterpene
Germacrene D	25.25	1460	0.25	[0.27]	1611	13.88*	Sesquiterpene
Methyl (Z)-isoeugenol	25.53	1463	0.04	0.04	2030	38.25	Phenylpropanoid
β -Selinene	25.85	1467	0.35	[1.93]	1616	14.11*	Sesquiterpene
Viridiflorene	26.05	1469	0.20	0.22	1620	14.37	Sesquiterpene
Bicyclogermacrene	26.49	1475	0.45	0.49	1650	15.96	Sesquiterpene
Valencene	27.17	1483	0.27	0.64	1659	16.46*	Sesquiterpene
(Z,E)- α -Farnesene	27.71	1489	0.35	[0.64]	1659	16.46*	Sesquiterpene
γ -Cadinene	28.26	1496	0.19	0.19	1654	16.18	Sesquiterpene
δ -Cadinene	28.93	1505	0.26				Sesquiterpene
trans- α -Bisabolene	31.17	1536	0.07	0.11	1698	18.52	Sesquiterpene
Spathulenol	33.45*	1568	1.62	0.10	2018	37.84	Sesquiterp. alcohol
Caryophyllene oxide	33.45*	1568	[1.62]	0.56	1834	27.93	Sesquiterp. ether
Elemicin	33.45*	1568	[1.62]	0.33	2130	41.23	Phenylpropanoid
Viridiflorol	33.92	1574	0.13	0.15	1978	36.33	Sesquiterp. alcohol
Globulol	34.21	1578	0.04	0.05	1971	35.97	Sesquiterp. alcohol
Junenol	35.63	1598	0.11	[5.44]	1925	33.88*	Sesquiterp. alcohol
Cubenol	36.68	1622	0.18	0.10	1940	34.59	Sesquiterp. alcohol
β -Eudesmol	37.47	1642	0.34	0.27	2096	40.32	Sesquiterp. alcohol
α -Eudesmol	37.67	1647	0.23	0.15	2110	40.71	Sesquiterp. alcohol
Total Identified			95.90%	94.94%			

*: Two or more compounds are coeluting on this column

(x): 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 : 1.4708 \pm 0.0003 (20 °C)

CONCLUSION

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

