

ANALYSIS Laurel Essential Oil

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Date : February 8, 2018

SAMPLE IDENTIFICATION

Internal code : 18A25-FSE1-1-CC

Customer identification : Juniper Berry - Lot # SA181017

Type : Essential oil

Source : *Juniperus communis*

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 : Benoit Roger Ph. D.

Analysis date : 2018-02-05



Checked and approved by :

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



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IDENTIFIED COMPOUNDS

Identification	Column: BPS			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Toluene	1.32	758	0.01	54.64	963	1.07*	Simple phenolic
Tricyclene	3.23	915	0.13	0.13	921	0.92	Monoterpene
α -Thujene	3.32	920	0.96	1.23	965	1.08*	Monoterpene
α -Pinene	3.50	931	54.73	[54.64]	963	1.07*	Monoterpene
α -Fenchene	3.69	942	0.05	0.05	992	1.21	Monoterpene
Camphene	3.71	944	0.40	0.39	999	1.26	Monoterpene
Thuja-2,4(10)-diene	3.80	949	0.17	7.30	1066	1.76*	Monoterpene
Verbenene	3.99	960	0.02	[1.23]	965	1.08*	Monoterpene
Sabinene	4.16	970	7.15	[7.30]	1066	1.76*	Monoterpene
β -Pinene	4.22	973	3.40	3.38	1044	1.59	Monoterpene
Myrcene	4.51	991	9.60	9.55	1121	2.30	Monoterpene
2-Carene	4.60	996	0.01	0.01	1075	1.83	Monoterpene
Pseudolimonene	4.70	1002	0.01	0.08	1111	2.17*	Monoterpene
α -Phellandrene	4.76*	1005	0.27	[0.08]	1111	2.17*	Monoterpene
Δ^3 -Carene	4.76*	1005	[0.27]	0.16	1097	2.00	Monoterpene
α -Terpinene	4.95	1015	0.33	0.33	1124	2.34	Monoterpene
Limonene	5.20*	1025	5.70	4.93	1144	2.58	Monoterpene
para-Cymene	5.20*	1028	[5.70]	0.72	1208	3.41	Monoterpene
β -Phellandrene	5.22*	1029	0.46	0.48	1148	2.63*	Monoterpene
1,8-Cineole	5.22*	1029	[0.46]	[0.48]	1148	2.63*	Monoterp. ether
trans- β -Ocimene	5.54	1047	0.02	0.02	1202	3.32	Monoterpene
γ -Terpinene	5.73	1057	0.63	0.63	1186	2.84	Monoterpene
cis-Sabinene hydrate	6.06	1075	0.03	0.04	1410	6.39	Monoterp. alcohol
Terpinolene	6.20	1083	0.75	0.75	1222	3.61	Monoterpene
para-Cymenene	6.43	1095	0.11	0.08	1370	5.74	Monoterpene
α -Pinene oxide	6.53*	1100	0.07	0.03	1301	4.72	Monoterp. ether
Perillene	6.53*	1100	[0.07]	0.01	1343	5.33	Monoterp. ether
Linalool	6.70*	1106	0.14	0.13	1503	8.25*	Monoterp. alcohol
trans-Sabinene hydrate	6.70*	1106	[0.14]	0.08	1481	7.81	Monoterp. alcohol
α -Thujone	6.86	1112	0.05	0.06	1362	5.62	Monoterp. ketone
cis-para-Menth-2-en-1-ol	7.26	1126	0.08	[0.13]	1503	8.25*	Monoterp. alcohol
trans-Pinocarveol	7.62	1139	0.15	0.14	1575	10.52	Monoterp. alcohol
Camphor	7.76	1144	0.02	0.02	1428	6.74	Monoterp. ketone
trans-Verbenal	7.83	1147	0.05	0.37	1608	11.63*	Monoterp. alcohol
Borneol	8.66	1176	0.06	1.72	1618	12.10*	Monoterp. alcohol
Terpinen-4-ol	8.82	1182	0.96	1.05	1532	9.17*	Monoterp. alcohol
para-Cymen-8-ol	9.33	1200	0.06	0.06	1775	20.33	Monoterp. alcohol
Myrtenal	9.39	1201	0.08	[1.05]	1532	9.17*	Monoterp. aldehyde
α -Terpineol	9.48	1203	0.20	0.33	1628	12.58	Monoterp. alcohol
Verbenone	9.83	1211	0.08	[0.37]	1608	11.63*	Monoterp. ketone
Methyl citronellate	11.90	1256	0.08	0.09	1509	8.45	Monoterp. ester

Bornyl acetate	12.90	1278	0.25	0.23	1507	8.37	Monoterp. ester
α -Cubebene	15.99	1330	0.63	0.64	1408	6.25	Sesquiterpene
α -Terpinyl acetate	16.66	1341	0.03	0.03	1623	12.82	Monoterp. ester
α -Ylangene	17.24	1349	0.05	0.04	1418	6.54	Sesquiterpene
α -Copaene	17.71	1356	0.49	0.51	1425	6.69	Sesquiterpene
β -Cubebene	18.68	1371	0.05	0.06	1471	7.59	Sesquiterpene
β -Elemene	18.96	1375	0.67	0.67	1520	8.81	Sesquiterpene
Longifolene	19.55	1384	0.26	0.28	1477	7.71	Sesquiterpene
β -Caryophyllene	20.67	1400	2.40	2.39	1517	8.71	Sesquiterpene
β -Copaene	21.53	1410	0.07	0.03	1511	8.51	Sesquiterpene
Thujopsen	21.69	1412	0.01	0.01	1541	9.46	Sesquiterpene
γ -Elemene	21.89	1415	0.09	0.10	1565	10.21	Sesquiterpene
<i>cis</i> - β -Farnesene	22.99	1428	0.03	0.03	1583	10.79	Sesquiterpene
α -Humulene	23.45	1433	1.36	1.40	1580	10.67*	Sesquiterpene
<i>trans</i> - β -Farnesene	24.53	1446	0.35	0.34	1614	11.92	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	25.11	1453	0.08	[1.40]	1580	10.67*	Sesquiterpene
Germacrene D	25.69*	1460	1.95	[1.72]	1618	12.10*	Sesquiterpene
γ -Murololene	25.69*	1460	[1.95]	[0.37]	1608	11.63*	Sesquiterpene
β -Selinene	26.27	1467	0.15	0.14	1622	12.27	Sesquiterpene
Bicyclogermacrene	26.90*	1474	0.22	0.22	1640	13.14*	Sesquiterpene
α -Selinene	26.90*	1474	[0.22]	[0.22]	1640	13.14*	Sesquiterpene
Valencene	27.68*	1484	0.2	0.13	1660	14.00	Sesquiterpene
α -Murololene	27.68*	1484	[0.21]	0.07	1637	12.97	Sesquiterpene
γ -Cadinene	28.73	1496	0.23	0.24	1664	14.19	Sesquiterpene
δ -Cadinene	29.39	1505	0.70	0.72	1670	14.51	Sesquiterpene
<i>trans</i> -Calamenene	29.77	1510	0.04	0.03	1731	17.70	Sesquiterpene
α -Cadinene	30.46	1520	0.04	0.03	1699	15.80	Sesquiterpene
Germacrene B	32.08	1543	0.68	0.67	1718	16.89	Sesquiterpene
Caryophyllene oxide	33.84*	1568	0.18	0.13	1846	25.04	Sesquiterp. ether
(<i>E</i>)-Nerolidol	33.84*	1568	[0.18]	0.03	1992	34.31	Sesquiterp. alcohol
Spathulenol	34.02	1570	0.07	0.07	2022	35.81	Sesquiterp. alcohol
Humulene epoxide II	35.51	1592	0.06	0.06	1898	28.77	Sesquiterp. ether
1- <i>epi</i> -Cubenol	37.08	1625	0.06	0.11	1960	32.43	Sesquiterp. alcohol
1-Cadinol	37.56	1637	0.01	0.01	2075	37.62	Sesquiterp. alcohol
1-Murolol	37.68	1640	0.01	0.01	2088	38.06	Sesquiterp. alcohol
α -Cadinol	38.12	1651	0.03	0.19	2130	39.40*	Sesquiterp. alcohol
meta-Camphorene	46.93	1938	0.14	[0.19]	2130	39.40*	Diterpene
para-Camphorene	47.82	1974	0.05	0.06	2175	40.61	Diterpene
Total identified			98.67%	98.67%			

*: 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: 1.4728 ± 0.0003 (20 °C)

CONCLUSION

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

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