

Date : September 22, 2017

SAMPLE IDENTIFICATION

Internal code : 17I07-ORA21-1-DM

Customer identification : Juniper

Type : Essential oil

Source : *Juniperus communis*

Customer : Organic Aromas

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 : Alexis St-Gelais, M. Sc., chimiste

Analysis date : 2017-09-18

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.	
Tricyclene	3.23	915	0.08	0.07	914	1.09	Monoterpene
α -Thujene	3.32	921	2.47	35.72	948	1.23*	Monoterpene
α -Pinene	3.47	930	33.99	[35.72]	948	1.23*	Monoterpene
α -Fenchene	3.69	942	0.03	0.41	989	1.49*	Monoterpene
Camphene	3.71	944	0.26	[0.41]	989	1.49*	Monoterpene
Thuja-2,4(10)-diene	3.80	949	0.14	14.95	1058	2.06*	Monoterpene
Sabinene	4.17	971	15.00	[14.95]	1058	2.06*	Monoterpene
β -Pinene	4.22	974	2.23	2.03	1035	1.86	Monoterpene
Myrcene	4.51	991	10.41	10.81	1113	2.65*	Monoterpene
Δ^3 -Carene	4.76*	1005	0.29	0.20	1089	2.35	Monoterpene
α -Phellandrene	4.76*	1005	[0.29]	0.08	1105	2.54	Monoterpene
α -Terpinene	4.94	1015	0.62	[10.81]	1113	2.65*	Monoterpene
para-Cymene	5.15	1026	3.20	3.09	1209	3.89*	Monoterpene
Limonene	5.19	1028	3.67	4.32	1138	2.97*	Monoterpene
β -Phellandrene	5.21	1030	0.58	[4.32]	1138	2.97*	Monoterpene
<i>trans</i> - β -Ocimene	5.53	1047	0.02	[3.09]	1209	3.89*	Monoterpene
γ -Terpinene	5.73	1058	1.54	1.49	1184	3.61	Monoterpene
<i>cis</i> -Sabinene hydrate	6.05	1075	0.06	0.61	1403	6.99*	Monoterp. alcohol
Terpinolene	6.20	1083	1.04	1.05	1223	4.11	Monoterpene
para-Cymenene	6.42	1095	0.23	0.22	1365	6.29	Monoterpene
Perillene	6.53*	1100	0.08	0.02	1347	5.99	Monoterp. ether
α -Pinene oxide	6.53*	1100	[0.08]	0.06	1298	5.22	Monoterp. ether
Linalool	6.69	1106	0.11	0.14	1492	9.10*	Monoterp. alcohol
<i>trans</i> -Sabinene hydrate	6.78	1109	0.04	[0.14]	1492	9.10*	Monoterp. alcohol
<i>cis</i> -Verbenol?	6.85	1112	0.07	1.54	1516	9.95*	Monoterp. alcohol
α -Campholenal	7.22	1125	0.08				Monoterp. aldehyde
<i>cis</i> -para-Menth-2-en-1-ol	7.26	1127	0.10	0.39	1501	9.42*	Monoterp. alcohol
<i>trans</i> -Pinocarveol	7.61	1139	0.21	0.50	1564	11.76*	Monoterp. alcohol
<i>trans</i> -para-Menth-2-en-1-ol	7.73	1144	0.12	0.11	1549	11.20	Monoterp. alcohol
Sabinaketone	8.23	1162	0.06	0.14	1591	12.77	Normonoterp. ketone
Borneol	8.65	1177	0.11	3.49	1617	14.02*	Monoterp. alcohol
Terpinen-4-ol	8.85	1184	4.06	5.80	1523	10.22*	Monoterp. alcohol
para-Cymen-8-ol	9.35	1201	0.28	0.18	1760	22.47	Monoterp. alcohol
α -Terpineol	9.47*	1203	0.36	[3.49]	1617	14.02*	Monoterp. alcohol
Myrtenal	9.47*	1203	[0.36]	[5.80]	1523	10.22*	Monoterp. aldehyde
Myrtenol	9.84	1211	0.12	1.90	1716	19.51*	Monoterp. alcohol
Verbenone	10.46	1225	0.10	0.13	1601	13.17	Monoterp. ketone
<i>trans</i> -Carveol	10.81	1233	0.04	0.05	1747	21.64	Monoterp. alcohol
<i>cis</i> -Ascaridol glycol	11.64	1251	0.05				Monoterp. alcohol
Bornyl acetate	12.91	1279	0.26	[0.39]	1501	9.42*	Monoterp. ester
<i>trans</i> -Ascaridol glycol	13.33	1288	0.06				Monoterp. alcohol

δ-Elemene	15.32	1321	0.07	0.09	1421	7.38	Sesquiterpene
α-Cubebene	15.99	1331	0.46	[0.61]	1403	6.99*	Sesquiterpene
α-Terpinyl acetate	16.66	1341	0.14	[3.49]	1617	14.02*	Monoterp. ester
α-Ylangene	17.25	1350	0.11	0.10	1409	7.12	Sesquiterpene
α-Copaene	17.70	1357	0.34	0.38	1428	7.55	Sesquiterpene
β-Cubebene	18.70	1372	0.09	0.27	1479	8.80*	Sesquiterpene
β-Elemene	18.96	1376	1.32	[5.80]	1523	10.22*	Sesquiterpene
Longifolene	19.55	1385	0.11	[0.27]	1479	8.80*	Sesquiterpene
α-Gurjunene	19.67	1387	0.07	0.06	1457	8.26	Sesquiterpene
β-Caryophyllene	20.63	1401	1.69	[1.54]	1516	9.95*	Sesquiterpene
γ-Elemene	21.89	1416	0.32	[0.50]	1564	11.76*	Sesquiterpene
α-Humulene	23.43	1434	1.23	1.37	1578	12.30*	Sesquiterpene
<i>trans</i> -β-Farnesene	24.53	1447	0.32	[3.49]	1617	14.02*	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	25.11	1454	0.12	[1.37]	1578	12.30*	Sesquiterpene
γ-Muurolene	25.59	1460	0.69	0.70	1607	13.49	Sesquiterpene
Germacrene D	25.68	1461	2.07	[3.49]	1617	14.02*	Sesquiterpene
β-Selinene	26.25	1468	0.33	[3.49]	1617	14.02*	Sesquiterpene
α-Selinene	26.88	1475	0.45	0.49	1627	14.59	Sesquiterpene
Bicyclgermacrene	27.45	1482	0.05	0.56	1640	15.25*	Sesquiterpene
α-Muurolene	27.66	1484	0.41	[0.56]	1640	15.25*	Sesquiterpene
γ-Cadinene	28.71	1497	0.60	0.66	1663	16.51	Sesquiterpene
δ-Cadinene	29.39	1506	1.23	1.32	1670	16.87	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	30.27	1519	0.03	0.06	1687	17.78	Sesquiterpene
Selina-3,7(11)-diene	30.42	1521	0.15	0.24	1674	17.10*	Sesquiterpene
Selina-4(15),7(11)-diene	30.70	1525	0.11	[0.24]	1674	17.10*	Sesquiterpene
α-Cadinene	30.84	1527	0.10	0.18	1699	18.41	Sesquiterpene
Germacrene B	32.09	1544	1.86	[1.90]	1716	19.51*	Sesquiterpene
α-Elemol	32.61	1552	0.03	0.04	1985	36.48	Sesquiterp. alcohol
Caryophyllene oxide	33.81	1568	0.21	0.20	1839	28.10	Sesquiterp. ether
Spathulenol	33.95	1570	0.23	0.25	2008	37.43	Sesquiterp. alcohol
Humulene epoxide II	35.48	1592	0.10	0.12	1891	31.91	Sesquiterp. ether
τ-Cadinol	37.52	1637	0.06	0.07	2071	39.41	Sesquiterp. alcohol
τ-Muurolol	37.63	1640	0.03	0.04	2090	40.03	Sesquiterp. alcohol
α-Cadinol	38.07	1651	0.09	0.14	2115	40.75	Sesquiterp. alcohol
meta-Camphorene	46.93	1939	0.12	0.12	2129	41.12	Diterpene
para-Camphorene	47.82	1975	0.04	0.02	2192	42.75	Diterpene
Total identified			97.55%	96.98%			

*: 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

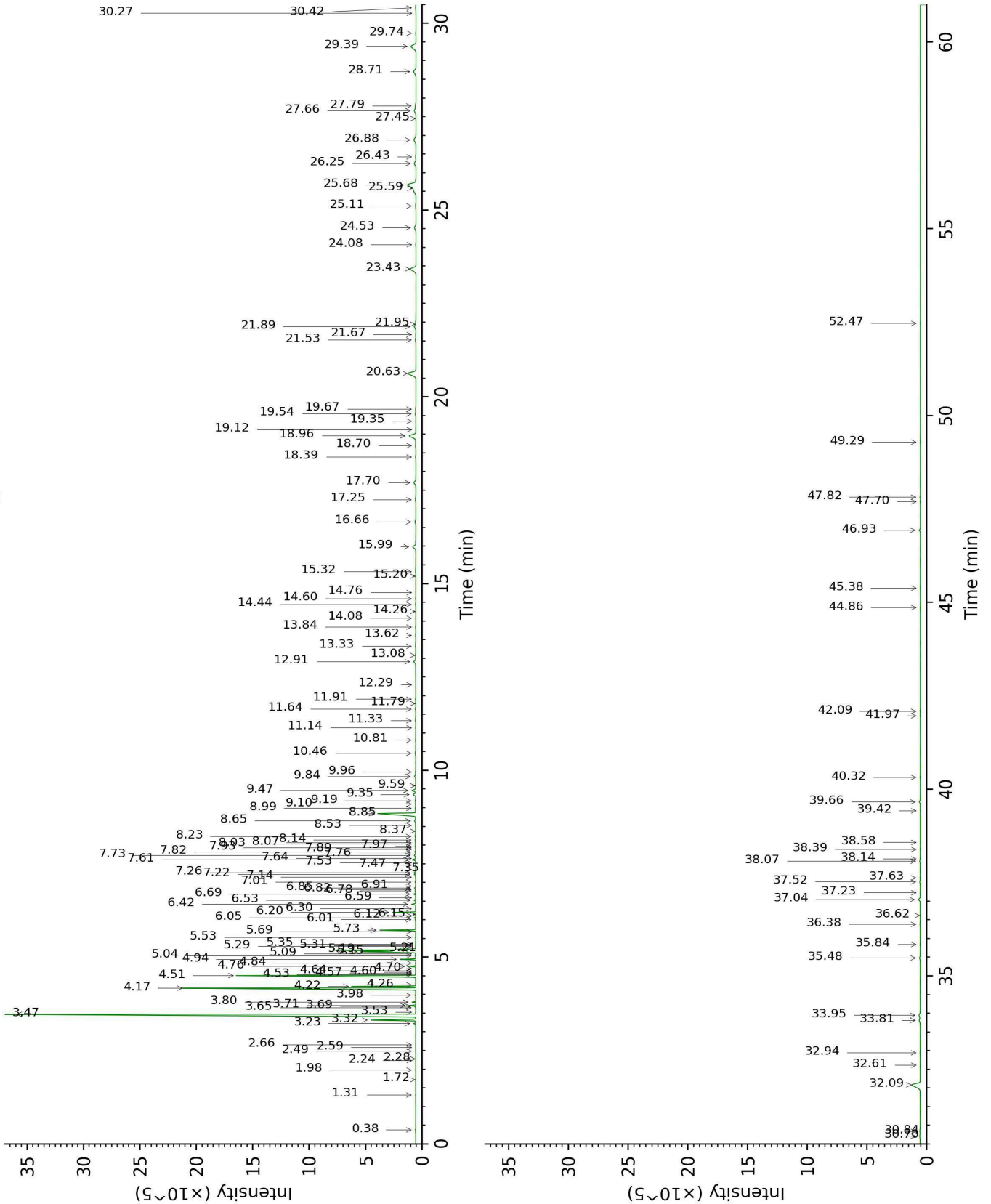
Physical aspect : Clear liquid

Refractive index : 1.4750 ± 0.0003 (20 °C)

CONCLUSION

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

17107-ORA21-1-DM_BP5



17107-ORA21-1-DM_WAX

