

GC/MS BATCH NUMBER: J20105

ESSENTIAL OIL: JUNIPER BERRY
BOTANICAL NAME: JUNIPERUS COMMUNIS
ORIGIN: EASTERN EUROPE

KEY CONSTITUENTS PRESENT IN THIS BATCH OF JUNIPER BERRY OIL	%
α -PINENE	39.5
β -PINENE	14.9
SABINENE	10.1
MYRCENE	9.4
β -CARYOPHYLLENE	4.9
GERMACRENE D	3.0
LIMONENE	2.7
α -HUMULENE	1.4
GERMACRENE B	1.2
δ -CADINENE	1.1
TERPINEN-4-OL	1.0

Comments from Robert Tisserand: Sweet, green-resinous fruity odor quality. Ten of eleven key ISO constituents are within range, with beta-pinene marginally high - not a concern.

Date : January 18, 2018

SAMPLE IDENTIFICATION

Internal code : 18A12-PTH1-1-CC

Customer identification : Juniper Berry - Eastern Europe - J20105710R

Type : Essential oil

Source : *Juniperus communis*

Customer : Plant Therapy

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 : 2018-01-18

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.	
Toluene	1.32*	759	tr	39.47	954	1.08*	Simple phenolic
Tricyclene	3.24	915	0.09	0.09	915	0.94	Monoterpene
α-Thujene	3.32	921	0.85	1.08	958	1.09	Monoterpene
α-Pinene	3.49	930	39.47	[39.47]	954	1.08*	Monoterpene
α-Fenchene	3.70	942	0.02	0.03	985	1.23	Monoterpene
Camphene	3.72	944	0.40	0.39	993	1.28	Monoterpene
Thuja-2,4(10)-diene	3.81	949	0.05	10.14	1061	1.80*	Monoterpene
Sabinene	4.18	971	10.06	[10.14]	1061	1.80*	Monoterpene
β-Pinene	4.26	976	14.87	14.91	1042	1.65	Monoterpene
Camphene analog II	4.34	981	0.03				Monoterpene
Myrcene	4.52	991	9.36	9.33	1114	2.33	Monoterpene
Pseudolimonene	4.72	1002	0.06	0.05	1107	2.24	Monoterpene
Δ3-Carene	4.77*	1005	0.14	0.06	1089	2.03	Monoterpene
α-Phellandrene	4.77*	1005	[0.14]	0.06	1104	2.21	Monoterpene
α-Terpinene	4.96	1015	0.35	0.35	1118	2.38	Monoterpene
para-Cymene	5.16	1026	0.46	0.52	1205	3.45	Monoterpene
Limonene	5.19	1028	2.69	2.61	1136	2.60	Monoterpene
β-Phellandrene	5.22	1030	0.32	0.34	1141	2.66	Monoterpene
1,8-Cineole	5.24	1031	0.01	0.01	1150	2.77	Monoterp. ether
cis-β-Ocimene	5.36	1037	tr	0.80	1181	3.18*	Monoterpene
trans-β-Ocimene	5.54	1047	0.03	0.03	1198	3.36	Monoterpene
γ-Terpinene	5.74	1058	0.80	[0.80]	1181	3.18*	Monoterpene
cis-Sabinene hydrate	6.08	1076	0.03	0.03	1404	6.45	Monoterp. alcohol
Terpinolene	6.22	1084	0.75	0.75	1219	3.65	Monoterpene
para-Cymenene	6.44	1096	0.05	0.03	1365	5.79	Monoterpene
Perillene	6.55	1100	0.01	0.02	1337	5.38	Monoterp. ether
Linalool	6.72	1107	0.08	0.10	1495	8.35*	Monoterp. alcohol
α-Thujone	6.88	1112	0.01	0.01	1348	5.54	Monoterp. ketone
cis-para-Menth-2-en-1-ol	7.25	1126	0.02	[0.10]	1495	8.35*	Monoterp. alcohol
α-Campholenal	7.28	1127	0.06				Monoterp. aldehyde
trans-Pinocarveol	7.64	1140	0.06	0.06	1567	10.66	Monoterp. alcohol
Camphor	7.78	1145	0.02	0.41	1419	6.75*	Monoterp. ketone
trans-Verbenol	7.85	1148	0.02	0.02	1602	11.94	Monoterp. alcohol
Citronellal	8.01	1153	0.01	[0.41]	1419	6.75*	Monoterp. aldehyde
Borneol	8.69	1178	0.03	0.19	1612	12.44*	Monoterp. alcohol
Terpinen-4-ol	8.85	1183	1.02	1.06	1525	9.29*	Monoterp. alcohol
para-Cymen-8-ol	9.36	1200	0.02	0.01	1764	20.63	Monoterp. alcohol
Myrtenal	9.43	1202	0.03	0.03	1528	9.41	Monoterp. aldehyde
α-Terpineol	9.52	1204	0.13	0.35	1619	12.74*	Monoterp. alcohol
Verbenone	9.87	1212	0.03	0.41	1598	11.78	Monoterp. ketone
Thymol methyl ether	10.53	1226	0.02	[1.06]	1525	9.29*	Monoterp. ether

Methyl citronellate	11.93	1257	0.02	0.03	1505	8.67	Monoterp. ester
Bornyl acetate	12.93	1279	0.16	0.17	1499	8.46	Monoterp. ester
α -Cubebene	16.03	1331	0.39	0.39	1396	6.31	Sesquiterpene
α -Terpinyl acetate	16.70	1341	0.05	[0.19]	1612	12.44*	Monoterp. ester
α -Ylangene	17.28	1350	0.04	0.03	1412	6.61	Sesquiterpene
α -Copaene	17.76	1357	0.40	[0.41]	1419	6.75*	Sesquiterpene
β -Cubebene	18.73	1372	0.08	0.11	1471	7.79	Sesquiterpene
β -Elemene	19.02	1376	0.80	0.78	1513	8.92	Sesquiterpene
Sibirene	19.60*	1385	0.11	0.03	1493	8.29	Sesquiterpene
Longifolene	19.60*	1385	[0.11]	0.05	1476	7.90	Sesquiterpene
α -Gurjunene	19.74	1387	0.06	0.09	1465	7.67	Sesquiterpene
β -Caryophyllene	20.78	1401	4.91	4.99	1511	8.85	Sesquiterpene
Thujopsen	21.60	1411	0.06	0.05	1540	9.77	Sesquiterpene
γ -Elemene	21.96	1415	0.16	0.16	1557	10.33	Sesquiterpene
Aromadendrene	22.09	1417	0.04	0.06	1517	9.05	Sesquiterpene
<i>cis</i> - β -Farnesene	23.06	1429	0.07	1.44	1572	10.80*	Sesquiterpene
α -Humulene	23.53	1434	1.36	[1.44]	1572	10.80*	Sesquiterpene
<i>trans</i> - β -Farnesene	24.60	1447	0.30	0.30	1605	12.08	Sesquiterpene
<i>trans</i> -Cadin-1(6),4-diene	25.18	1454	0.10	[1.44]	1572	10.80*	Sesquiterpene
Germacrene D	25.80	1461	2.98	2.72	1609	12.28	Sesquiterpene
β -Selinene	26.35	1468	0.21	[0.35]	1619	12.74*	Sesquiterpene
α -Selinene	26.98	1475	0.50	0.50	1628	13.15	Sesquiterpene
α -Muurolene	27.77	1485	0.24	0.21	1650	14.19	Sesquiterpene
α -Zingiberene	27.90	1486	0.25				Sesquiterpene
γ -Cadinene	28.83	1497	0.35	0.34	1654	14.38	Sesquiterpene
δ -Cadinene	29.50	1506	1.11	1.07	1661	14.72	Sesquiterpene
Selina-3,7(11)-diene	30.56	1522	0.10	0.07	1667	14.98	Sesquiterpene
α -Cadinene	30.83	1525	0.05	0.06	1688	16.01	Sesquiterpene
Germacrene B	32.17	1544	1.16	1.16	1707	17.13	Sesquiterpene
Caryophyllene oxide	33.90	1569	0.09	0.06	1833	25.34	Sesquiterp. ether
Spathulenol	34.08	1571	0.05	0.04	2007	35.99	Sesquiterp. alcohol
α -Cedrol	35.57	1592	0.02	0.01	1982	34.94	Sesquiterp. alcohol
τ -Cadinol	37.62	1639	0.03	0.03	2058	37.79	Sesquiterp. alcohol
τ -Muurolol	37.73	1642	0.03	0.03	2073	38.31	Sesquiterp. alcohol
α -Muurolol	37.85	1645	0.01	0.01	2090	38.91	Sesquiterp. alcohol
α -Cadinol	38.17	1652	0.06	0.09	2113	39.55*	Sesquiterp. alcohol
meta-Camphorene	46.97	1940	0.03	[0.09]	2113	39.55*	Diterpene
para-Camphorene	47.86	1975	0.01	0.01	2167	41.02	Diterpene
Total identified			98.85%	98.84%			

*: 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 : 1.4740 ± 0.0003 (20 °C)

CONCLUSION

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

18A12-PTH1-1-CC_WAX

