

GC/MS BATCH NUMBER: CL0107

ESSENTIAL OIL: CYPRESS

BOTANICAL NAME: CUPRESSUS SEMPERVIRENS

ORIGIN: FRANCE

KEY CONSTITUENTS PRESENT IN THIS BATCH OF CYPRESS OIL	%
α -PINENE	55.7
Δ^3 -CARENE	21.7
TERPINOLENE	3.0
LIMONENE	2.2
MYRCENE	2.2
α -TERPINYL ACETATE	1.4
β -PINENE	1.1
α -CEDROL	1.1

Comments from Robert Tisserand: Fresh, green, woody-nutty odor quality. All nine key ISO constituents are within range.

Date : April 12, 2018

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 18D03-PTH2-1-CC

Customer identification : Cypress Oil - France - CL010781R

Type : Essential oil

Source : *Cupressus sempervirens*

Customer : Plant Therapy

ANALYSIS

Method: PC-PA-014-17J19 - Analysis of the composition of an essential oil, or other volatile liquid, by FAST GC-FID (in French); identifications validated by GC-MS.

Analyst : Sarah-Eve Tremblay, M. Sc. A., Chimiste

Analysis date : April 10, 2018

Checked and approved by :

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

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PHYSICOCHEMICAL DATA

Physical aspect: Clear liquid

Refractive index: 1.4698 ± 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method.

ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
Toluene	0.01	55.80*	Simple phenolic
Unknown	tr	tr	Alkene
Cyclofenchene	0.01	0.02	Monoterpene
Bornylene	0.04	0.05	Monoterpene
Tricyclene	0.20	0.20	Monoterpene
α -Thujene	0.45	0.46	Monoterpene
α -Pinene	55.72	[55.80]*	Monoterpene
α -Fenchene	1.02	0.51	Monoterpene
Camphene	[1.02]	0.51	Monoterpene
Thuja-2,4(10)-diene	0.03	0.74*	Monoterpene
meta-Cymene	0.06	2.21*	Monoterpene
Sabinene	1.82*	[0.74]*	Monoterpene
β -Pinene	[1.82]*	1.11	Monoterpene
Pseudolimonene isomer	0.01	tr*	Monoterpene
Myrcene	2.19	[2.21]*	Monoterpene
2-Carene	0.01	[tr]*	Monoterpene
α -Phellandrene	0.12*	0.11	Monoterpene
Pseudolimonene	[0.12]*	0.01	Monoterpene
Menthatriene isomer I	[0.12]*	0.01	Monoterpene
Δ^3 -Carene	21.72	21.78	Monoterpene
α -Terpinene	0.46	0.44	Monoterpene
ortho-Cymene	0.04	0.33*	Simple phenolic
para-Cymene	0.42*	[0.33]*	Monoterpene
Sylvestrene	[0.42]*	0.11	Monoterpene
Limonene	2.45*	2.21	Monoterpene
1,8-Cineole	[2.45]*	0.28*	Monoterpenic ether
β -Phellandrene	[2.45]*	[0.28]*	Monoterpene
(Z)- β -Ocimene	0.01	0.05*	Monoterpene
(E)- β -Ocimene	0.03	0.03	Monoterpene
Unknown	0.04	[0.05]*	Monoterpene
γ -Terpinene	0.61	0.61	Monoterpene
Unknown	0.01	0.01	Oxygenated monoterpene
cis-Linalool oxide (fur.)	0.01	0.01	Monoterpenic alcohol
meta-Cymenene	0.01	0.02	Monoterpene
Terpinolene isomer	0.03	0.03	Monoterpene
Isoterpinolene	0.09	0.11	Monoterpene
Terpinolene	3.07*	3.00	Monoterpene
para-Cymenene	[3.07]*	0.07	Monoterpene
α -Pinene oxide	0.02	0.02	Monoterpenic ether
Linalool	0.32*	0.31	Monoterpenic alcohol
Perillene	[0.32]*	tr*	Monoterpenic ether
Unknown	[0.32]*	tr	Oxygenated monoterpene
para-Mentha-1,3,8-triene	0.01	[tr]*	Monoterpene
endo-Fenchol	0.01	0.01	Monoterpenic alcohol
cis-para-Mentha-2-en-1-ol	0.01	0.01	Monoterpenic alcohol
4-Hydroxy-4-methylcyclohex-2-enone	0.01	0.01	Aliphatic alcohol
cis-para-Mentha-2,8-dien-1-ol	0.02*	0.02	Monoterpenic alcohol

<i>trans</i> -Pinocarveol	[0.02]*	0.02	Monoterpenic alcohol
Camphor	0.04	0.04*	Monoterpenic ketone
Epoxyterpinolene	0.03	0.01	Monoterpenic ether
meta-Mentha-4,6-dien-8-ol	0.01	0.02*	Monoterpenic alcohol
Karahanaenone	0.12	0.12	Monoterpenic ketone
Borneol	0.74	0.99*	Monoterpenic alcohol
α -Phellandren-8-ol	0.02	0.01	Monoterpenic alcohol
Umbellulone	0.03	0.02	Monoterpenic ketone
Unknown	0.95*		Oxygenated monoterpene
Terpinen-4-ol	[0.95]*	0.90	Monoterpenic alcohol
meta-Cymen-8-ol	0.01	0.03	Monoterpenic alcohol
para-Cymen-8-ol	0.01	0.01	Monoterpenic alcohol
Unknown	0.04		Oxygenated monoterpene
α -Terpineol	0.27	[0.99]*	Monoterpenic alcohol
Myrtenol	0.02	0.01	Monoterpenic alcohol
γ -Terpineol	0.02	0.48*	Monoterpenic alcohol
Unknown	0.02	0.01	Oxygenated monoterpene
Verbenone	0.01	0.06*	Monoterpenic ketone
<i>trans</i> -Carveol	0.01	0.01	Monoterpenic alcohol
Unknown	0.01	0.02	Oxygenated monoterpene
Carvacrol methyl ether	0.02	0.15*	Monoterpenic ether
Car-3-en-2-one	0.01	0.04*	Monoterpenic ketone
Linalyl acetate	0.23	0.39*	Monoterpenic ester
Unknown	0.01		Unknown
Unknown	0.01		Unknown
Bornyl acetate	0.74	0.76	Monoterpenic ester
Unknown	0.14*	[0.15]*	Monoterpenic ester
Cuminol	[0.14]*	1.07*	Monoterpenic alcohol
Terpinen-4-yl acetate	0.01	0.02	Monoterpenic ester
Thymol	0.03	0.02*	Monoterpenic alcohol
Unknown	0.02	0.01	Oxygenated monoterpene
Unknown	0.02		Unknown
Unknown	0.17	0.18	Monoterpenic ester
α -Terpinyl acetate	1.46*	1.38	Monoterpenic ester
α -Cubebene	[1.46]*	0.10	Sesquiterpene
α -Ylangene	0.02	0.01	Sesquiterpene
α -Copaene	0.04	0.03	Sesquiterpene
2-epi- α -Funebrene	0.03	[0.04]*	Sesquiterpene
α -Duprezianene	0.01	0.01	Sesquiterpene
β -Cubebene	0.02	0.01	Sesquiterpene
β -Elemene	0.02	0.31*	Sesquiterpene
α -Cedrene	0.28*	0.11*	Sesquiterpene
Sesquithujene	[0.28]*	[0.39]*	Sesquiterpene
β -Funebrene	[0.28]*	[0.11]*	Sesquiterpene
β -Cedrene	0.37*	0.09	Sesquiterpene
β -Caryophyllene	[0.37]*	[0.31]*	Sesquiterpene
<i>cis</i> -Thujopsene	0.03	0.02	Sesquiterpene
<i>cis</i> -Muuro-la-3,5-diene	0.03	0.02*	Sesquiterpene
<i>trans</i> -Muuro-la-3,5-diene	0.01	[0.02]*	Sesquiterpene
α -Humulene	0.10	0.11	Sesquiterpene
<i>cis</i> -Cadina-1(6),4-diene	0.08*	0.04	Sesquiterpene
<i>cis</i> -Muuro-la-4(15),5-diene	[0.08]*	0.05	Sesquiterpene

Unknown	0.01	[0.06]*	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	0.02	[0.02]*	Sesquiterpene
α -Amorphene	0.08	0.11*	Sesquiterpene
Germacrene D	0.50	[0.48]*	Sesquiterpene
<i>trans</i> -Muurolo-4(15),5-diene	0.01	0.02	Sesquiterpene
β -Alaskene	0.05	[0.11]*	Sesquiterpene
Epizonarene	0.03	0.05*	Sesquiterpene
α -Muurolole	0.05	0.11	Sesquiterpene
δ -Amorphene	0.01	[0.05]*	Sesquiterpene
α -Alaskene	0.04	0.04	Sesquiterpene
γ -Cadinene	0.05	[0.04]*	Sesquiterpene
δ -Cadinene	0.16*	0.16	Sesquiterpene
<i>trans</i> -Calamenene	[0.16]*	0.01	Sesquiterpene
Zonarene	[0.16]*	[0.04]*	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.01	0.01	Sesquiterpene
α -Cadinene	0.01	0.01	Sesquiterpene
Caryophyllene oxide	0.01	0.01	Sesquiterpenic ether
allo-Cedrol	0.01	0.01	Sesquiterpenic alcohol
α -Cedrol	1.08	[1.07]*	Sesquiterpenic alcohol
10-epi-Cubenol	0.01		Sesquiterpenic alcohol
1-epi-Cubenol	0.01	0.01	Sesquiterpenic alcohol
τ -Muurolole	0.01*	[0.02]*	Sesquiterpenic alcohol
τ -Cadinol	[0.01]*	0.01	Sesquiterpenic alcohol
α -Cadinol	0.01	0.01	Sesquiterpenic alcohol
Isopimaradiene	0.02	tr	Diterpene
Total identified	99.20%	99.25%	

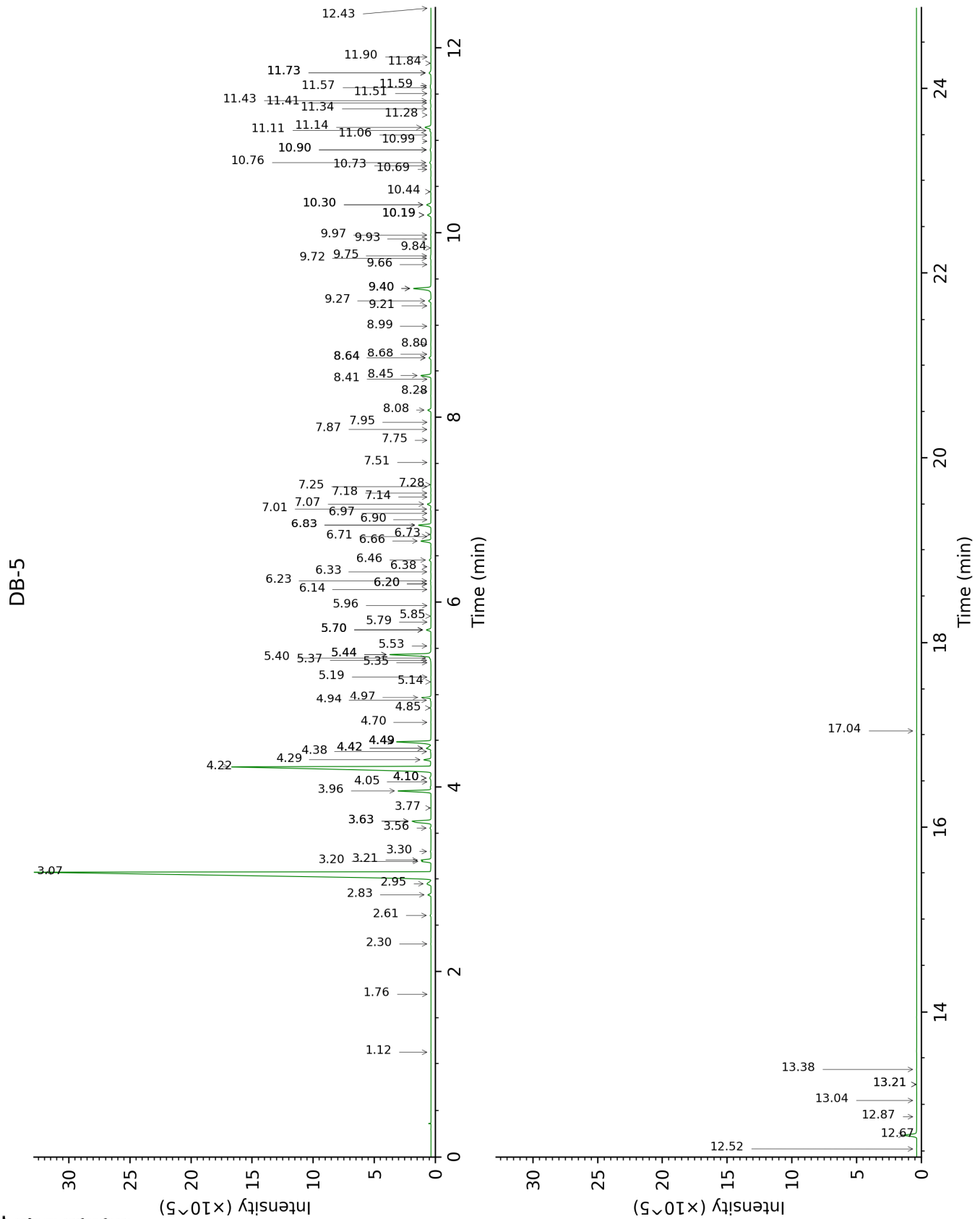
*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

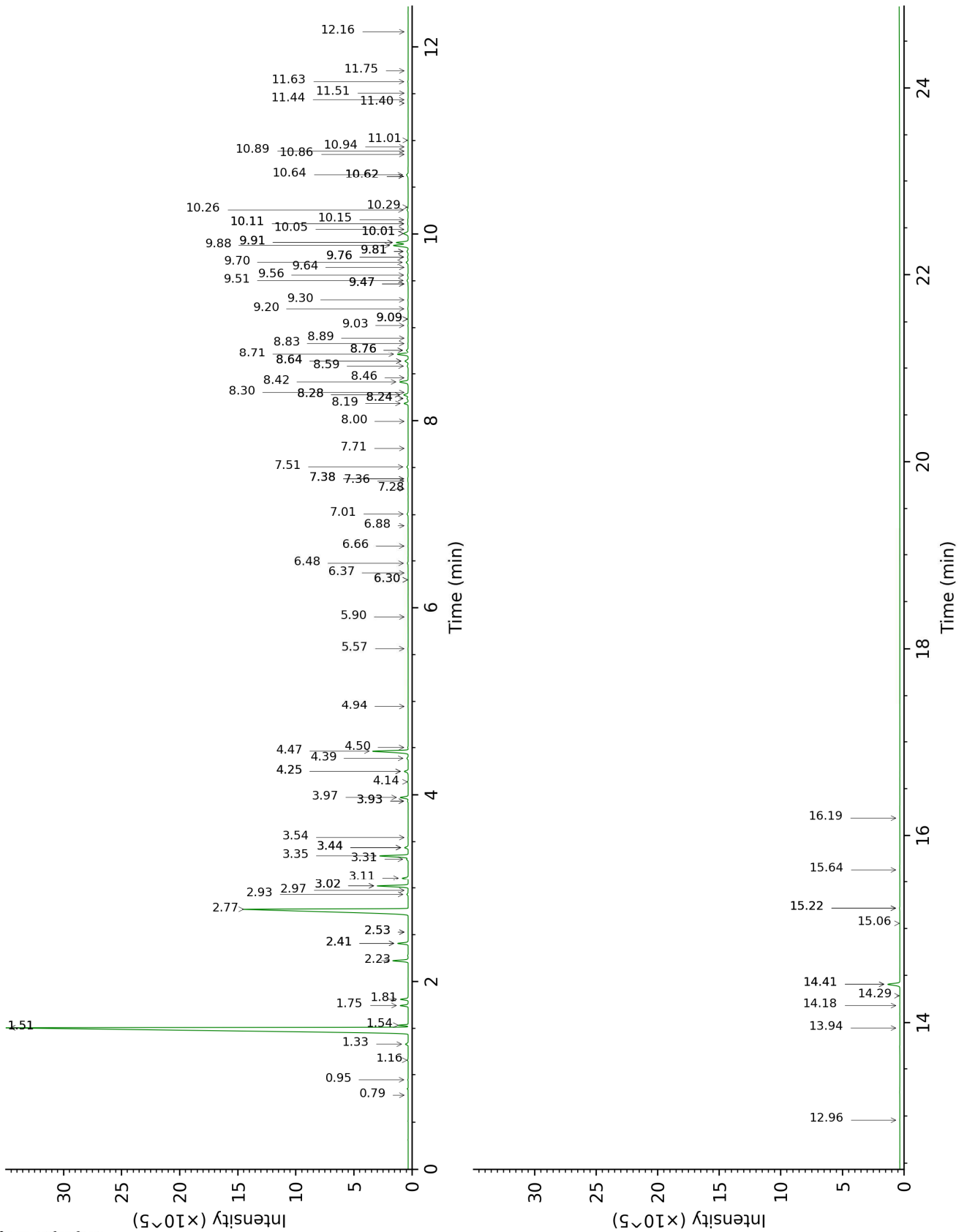
tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

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DB-WAX



FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Toluene	1.12	754	0.01	1.51*	1003	55.80
Unknown [m/z 109, 67 (32), 81 (14), 41 (12), 124 (10)]	1.76	827	tr	0.79	885	tr
Cyclofenchene	2.30	873	0.01	0.95	919	0.02
Bornylene	2.61	899	0.04	1.16	951	0.05
Tricyclene	2.83	914	0.20	1.34	978	0.20
α-Thujene	2.95	922	0.45	1.54	1006	0.46
α-Pinene	3.07	931	55.72	1.51*	1003	[55.80]
α-Fenchene	3.20†	939	1.02	1.75	1026	0.51
Camphene	3.21†	940	[1.02]	1.81	1032	0.51
Thuja-2,4(10)-diene	3.30	946	0.03	2.41*	1089	0.74
meta-Cymene	3.56	963	0.06	3.02*	1137	2.21
Sabinene	3.63*	968	1.82	2.41*	1089	[0.74]
β-Pinene	3.63*	968	[1.82]	2.22	1071	1.11
Pseudolimonene isomer	3.77	977	0.01	2.53*	1100	tr
Myrcene	3.96	990	2.19	3.02*	1137	[2.21]
2-Carene	4.05	996	0.01	2.53*	1100	[tr]
α-Phellandrene	4.10*	999	0.12	2.93	1130	0.11
Pseudolimonene	4.10*	999	[0.12]	2.97	1134	0.01
Menthatriene isomer I	4.10*	999	[0.12]	3.54	1177	0.01
Δ3-Carene	4.22	1006	21.72	2.77	1118	21.78
α-Terpinene	4.29	1011	0.46	3.11	1144	0.44
ortho-Cymene	4.38	1017	0.04	4.25*	1228	0.33
para-Cymene	4.42*	1019	0.42	4.25*	1228	[0.33]
Sylvestrene	4.42*	1019	[0.42]	3.31	1159	0.11
Limonene	4.49*	1024	2.45	3.35	1162	2.21
1,8-Cineole	4.49*	1024	[2.45]	3.44*	1169	0.28
β-Phellandrene	4.49*	1024	[2.45]	3.44*	1169	[0.28]
(Z)-β-Ocimene	4.70	1037	0.01	3.93*	1206	0.05
(E)-β-Ocimene	4.85	1046	0.03	4.14	1220	0.03
Unknown [m/z 93, 91 (54), 92 (31), 77 (29), 79 (17), 43 (13), 41 (10), 136 (9)]	4.94	1052	0.04	3.93*	1206	[0.05]
γ-Terpinene	4.97	1054	0.61	3.97	1209	0.61
Unknown [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	5.14	1065	0.01	4.94	1277	0.01
cis-Linalool oxide (fur.)	5.19	1068	0.01	6.66	1399	0.01

meta-Cymenene	5.35	1078	0.01	6.37	1378	0.02
Terpinolene isomer	5.37	1079	0.03	4.50	1246	0.03
Isoterpinolene	5.40	1081	0.09	4.39	1238	0.11
Terpinolene	5.44*	1083	3.07	4.47	1244	3.00
para-Cymenene	5.44*	1083	[3.07]	6.48	1386	0.07
α-Pinene oxide	5.53	1089	0.02	5.56	1320	0.02
Linalool	5.70*	1100	0.32	8.19	1514	0.31
Perillene	5.70*	1100	[0.32]	6.30*	1373	tr
Unknown [m/z 95, 150 (45), 110 (35), 107 (23), 109 (21)]	5.70*	1100	[0.32]	5.90	1344	tr
para-Mentha-1,3,8-triene	5.79	1105	0.01	6.30*	1373	[tr]
endo-Fenchol	5.85	1109	0.01	8.46	1535	0.01
cis-para-Menth-2-en-1-ol	5.96	1116	0.01	8.30	1523	0.01
4-Hydroxy-4-methylcyclohex-2-enone	6.14	1128	0.01	14.18	2029	0.01
cis-para-Mentha-2,8-dien-1-ol	6.20*	1132	0.02	9.64	1629	0.02
trans-Pinocarveol	6.20*	1132	[0.02]	9.30	1600	0.02
Camphor	6.23	1134	0.04	7.38*	1453	0.04
Epoxyterpinolene	6.33	1140	0.03	6.88	1416	0.01
meta-Mentha-4,6-dien-8-ol	6.38	1143	0.01	9.47*	1614	0.02
Karahanaenone	6.46	1148	0.12	7.51	1463	0.12
Borneol	6.66	1161	0.74	9.91*	1650	0.99
α-Phellandren-8-ol	6.71	1164	0.02	10.29	1681	0.01
Umbellulone	6.73	1166	0.03	9.03	1579	0.02
Unknown [m/z 43, 137 (89), 109 (69), 91 (49), 152 (45), 67 (31), 119 (29)]	6.83*	1172	0.95			
Terpinen-4-ol	6.83*	1172	[0.95]	8.71	1555	0.90
meta-Cymen-8-ol	6.90	1176	0.01	11.63	1795	0.03
para-Cymen-8-ol	6.97	1181	0.01	11.75	1805	0.01
Unknown [m/z 93, 59 (85), 81 (36), 92 (35), 43 (34), 121 (20), 136 (16)...]	7.01	1184	0.04			
α-Terpineol	7.07	1187	0.27	9.91*	1650	[0.99]
Myrtenol	7.14	1192	0.02	11.01	1742	0.01
γ-Terpineol	7.18	1195	0.02	10.00*	1658	0.48
Unknown [m/z 109, 91 (100), 81 (88), 94 (75), 119	7.25	1199	0.02	10.94	1736	0.01

(74), 96 (73), 41 (63)... 150 (2)]						
Verbenone	7.28	1200	0.01	9.76*	1638	0.06
<i>trans</i> -Carveol	7.52	1216	0.01	11.51	1784	0.01
Unknown [m/z 137, 152 (28), 43 (25), 91 (24), 109 (23), 119 (19)]	7.75	1232	0.01	11.44	1779	0.02
Carvacrol methyl ether	7.87	1240	0.02	8.76*	1558	0.15
Car-3-en-2-one	7.95	1245	0.01	10.62*	1709	0.04
Linalyl acetate	8.08	1254	0.23	8.28*	1521	0.39
Unknown [m/z 43, 111 (47), 93 (41), 55 (28), 67 (23), 41 (22)...]	8.28	1267	0.01			
Unknown [m/z 43, 79 (78), 128 (46), 58 (42), 127 (42)...]	8.41	1276	0.01			
Bornyl acetate	8.45	1279	0.74	8.42	1532	0.76
Unknown [m/z 121, 93 (97), 43 (81), 136 (48), 107 (47), 108 (44)...]	8.64*	1292	0.14	8.76*	1558	[0.15]
Cuminol	8.64*	1292	[0.14]	14.41*	2051	1.07
Terpinen-4-yl acetate	8.68	1294	0.01	8.89	1569	0.02
Thymol	8.80	1302	0.03	15.22*	2130	0.02
Unknown [m/z 150, 107 (98), 91 (79), 108 (61)]	8.99	1316	0.02	12.16	1842	0.01
Unknown [m/z 93, 92 (34), 43 (31), 91 (27)...]	9.21	1331	0.02			
Unknown [m/z 93, 43 (50), 121 (50), 136 (35)...]	9.27	1335	0.17	9.70	1633	0.18
α -Terpinyl acetate	9.40*	1344	1.46	9.88	1648	1.38
α -Cubebene	9.40*	1344	[1.46]	7.01	1425	0.10
α -Ylangene	9.66	1363	0.02	7.28	1445	0.01
α -Copaene	9.72	1367	0.04	7.36	1451	0.03
2-epi- α - Funebrene	9.75	1369	0.03	7.38*	1453	[0.04]
α -Duprezianene	9.84	1375	0.01	7.71	1477	0.01
β -Cubebene	9.93	1382	0.02	8.00	1499	0.01
β -Elemene	9.98	1385	0.02	8.64*	1549	0.31
α -Cedrene	10.19*	1400	0.28	8.24*	1518	0.11
Sesquithujene	10.19*	1400	[0.28]	8.28*	1521	[0.39]
β -Funebrene	10.19*	1400	[0.28]	8.24*	1518	[0.11]
β -Cedrene	10.30*	1408	0.37	8.58	1545	0.09

β -Caryophyllene	10.30*	1408	[0.37]	8.64*	1549	[0.31]
<i>cis</i> -Thujopsene	10.44	1419	0.03	8.83	1564	0.02
<i>cis</i> -Muuroala-3,5-diene	10.69	1437	0.03	9.09*	1584	0.02
<i>trans</i> -Muuroala-3,5-diene	10.73	1440	0.01	9.09*	1584	[0.02]
α -Humulene	10.76	1443	0.10	9.50	1617	0.11
<i>cis</i> -Cadina-1(6),4-diene	10.90*	1453	0.08	9.20	1593	0.04
<i>cis</i> -Muuroala-4(15),5-diene	10.90*	1453	[0.08]	9.56	1622	0.05
Unknown [m/z 161, 91 (57), 120 (46), 105 (42), 133 (25), 119 (22), 41 (21), 204 (21)]	11.00	1460	0.01	9.76*	1638	[0.06]
<i>trans</i> -Cadina-1(6),4-diene	11.06	1465	0.02	9.47*	1614	[0.02]
α -Amorphene	11.11	1468	0.08	9.82*	1643	0.11
Germacrene D	11.14	1471	0.50	10.00*	1658	[0.48]
<i>trans</i> -Muuroala-4(15),5-diene	11.28	1481	0.01	10.05	1662	0.02
β -Alaskene	11.34	1486	0.05	9.82*	1643	[0.11]
Epizonarene	11.41	1491	0.03	10.11*	1667	0.05
α -Muurolole	11.43	1492	0.05	10.26	1679	0.11
δ -Amorphene	11.51	1498	0.01	10.11*	1667	[0.05]
α -Alaskene	11.57	1503	0.04	10.15	1670	0.04
γ -Cadinene	11.59	1505	0.05	10.62*	1709	[0.04]
δ -Cadinene	11.73*	1516	0.16	10.64	1710	0.16
<i>trans</i> -Calamenene	11.73*	1516	[0.16]	11.40	1775	0.01
Zonarene	11.73*	1516	[0.16]	10.62*	1709	[0.04]
<i>trans</i> -Cadina-1,4-diene	11.84	1524	0.01	10.86	1729	0.01
α -Cadinene	11.90	1529	0.01	10.89	1732	0.01
Caryophyllene oxide	12.43	1570	0.01	12.96	1914	0.01
allo-Cedrol	12.52	1578	0.01	14.29	2039	0.01
α -Cedrol	12.67	1589	1.08	14.41*	2051	[1.07]
10-epi-Cubenol	12.87	1605	0.01			
1-epi-Cubenol	13.04	1619	0.01	13.94	2005	0.01
τ -Muurolol	13.22*	1633	0.01	15.22*	2130	[0.02]
τ -Cadinol	13.22*	1633	[0.01]	15.06	2114	0.01
α -Cadinol	13.38	1646	0.01	15.64	2172	0.01
Isopimaradiene	17.04	1972	0.02	16.19	2229	tr
Total identified		99.20%			99.25%	
Total reported		99.57%			99.49%	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

†: Peaks apexes were resolved, but peaks overlapped and were summed for analysis

tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

