Date : 2026-04-10

Certificate of Analysis - GC Profiling

Sample Identification

Internal code : 26A19-PTH06
Customer Identification : Balsam Fir - Canada - BN0114R
Type : Essential Oil
Source : *Abies balsamea ct. Eastern / Low thymol*
Customer : Plant Therapy

Checked an approved by:

Alexis St-Gelais, Ph. D., chimiste 2013-174

Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia. This report is digitally signed, it is only considered valid if the digital signature is intact. The results only describe the samples that were submitted to the assays. The compliance status of the sample is provided to facilitate the reading of the report. The client remains ultimately responsible for reviewing the results presented within this report and to establish compliance of the tested batch against relevant quality criteria.

This report is an update from the first version issued on 2026-01-26 to correct the customer identification.

Méthode certifiée ISO 17025:2017 Certified method

Laboratoire PhytoChemia

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Gas Chromatographic Analysis

Method : PC-MAT-014 - Analysis of the composition of an essential oil or other volatile liquide by FAST GC-FID
ISO
Results : See analysis summary (next page)
Analyst : Jean-Christophe Fortin, M. Sc.
Date : 2026-01-22

Physicochemical data

Refractive index : 1.4743 ± 0.0003 (20 °C)
Method : PC-MAT-016 - Measure of the refractive index of a liquid.
Analyst : Cindy Caron B. Sc.
Date : 2026-01-20

Conclusion

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

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Analysis Summary - Consolidated Contents

New readers of similar reports are encouraged to read table footnotes at least once.

Identification	%	Class
Isovaleral	tr	Aliphatic aldehyde
Toluene	0.01	Simple phenolic
Unknown	0.01	Unknown
Hexanal	0.01	Aliphatic aldehyde
(3*Z*)-Hexenol	0.03	Aliphatic alcohol
Hexanol	0.01	Aliphatic alcohol
Santene	2.45	Normonoterpene
Styrene	0.01	Simple phenolic
Unknown	0.03	Normonoterpene
Bornylene	0.01	Monoterpene
Tricyclene	0.91	Monoterpene
α-Thujene	0.17	Monoterpene
α-Pinene	12.68	Monoterpene
α-Fenchene	0.08	Monoterpene
Camphene	6.25	Monoterpene
Thuja-2,4(10)-diene	0.03	Monoterpene
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.05	Monoterpene
β-Pinene	27.38	Monoterpene
Sabinene	0.21	Monoterpene
Myrcene	1.63	Monoterpene
2-Carene	0.01	Monoterpene
Pseudolimonene	0.02	Monoterpene
α-Phellandrene	0.26	Monoterpene
Δ3-Carene	16.91	Monoterpene
(3*Z*)-Hexenyl acetate	0.01	Aliphatic ester
α-Terpinene	0.21	Monoterpene
Carvomenthene	0.02	Aliphatic alcohol
para-Cymene	0.20	Monoterpene
Limonene	9.74	Monoterpene
β-Phellandrene	6.94	Monoterpene
Benzyl alcohol	0.08	Simple phenolic
(*Z*)-β-Ocimene	0.01	Monoterpene
(*E*)-β-Ocimene	0.01	Monoterpene
γ-Terpinene	0.34	Monoterpene
Unknown	0.01	Oxygenated monoterpene
meta-Cymenene	0.01	Monoterpene
Fenchone	0.14	Monoterpenic ketone
Isoterpinolene	0.06	Monoterpene
γ-Campholenal	0.07	Aliphatic alcohol
para-Cymenene	0.08	Monoterpene

Terpinolene	1.27	Monoterpene
α-Thujone	0.01	Monoterpenic ketone
Linalool	0.09	Monoterpenic alcohol
Nonanal	0.01	Aliphatic aldehyde
endo-Fenchol	0.08	Monoterpenic alcohol
cis-para-Menth-2-en-1-ol	0.02	Monoterpenic alcohol
α-Campholenal	0.02	Monoterpenic aldehyde
trans-Pinocarveol	0.07	Monoterpenic alcohol
trans-para-Menth-2-en-1-ol	0.02	Monoterpenic alcohol
Camphor	0.81	Monoterpenic ketone
Camphene hydrate	0.08	Monoterpenic alcohol
meta-Mentha-4,6-dien-8-ol	0.02	Monoterpenic alcohol
Isoborneol	0.02	Monoterpenic alcohol
Pinocamphone	0.02	Monoterpenic ketone
Pinocarvone	0.04	Monoterpenic ketone
Borneol	0.56	Monoterpenic alcohol
α-Phellandren-8-ol	0.02	Monoterpenic alcohol
Isopinocamphone	0.04	Monoterpenic ketone
Terpinen-4-ol	0.26	Monoterpenic alcohol
Cryptone	0.04	Normonoterpenic ketone
para-Cymen-8-ol	0.04	Monoterpenic alcohol
α-Terpineol	0.52	Monoterpenic alcohol
Myrtenal	0.04	Monoterpenic aldehyde
Myrtenol	0.04	Monoterpenic alcohol
Methylchavicol	0.04	Phenylpropanoid
Unknown	0.03	Unknown
Verbenone	0.02	Monoterpenic ketone
endo-Fenchyl acetate	0.04	Monoterpenic ester
Citronellol	0.01	Monoterpenic alcohol
Thymol methyl ether	0.06	Monoterpenic ether
Carvone	0.01	Monoterpenic ketone
Piperitone	0.20	Monoterpenic ketone
Phellandral	0.04	Monoterpenic aldehyde
Isopulegyl acetate	0.02	Monoterpenic ester
Bornyl acetate	6.12	Monoterpenic ester
Isobornyl acetate	0.03	Monoterpenic ester
Thymol	0.04	Monoterpenic alcohol
2-Undecanone	0.02	Aliphatic ketone
Isohexyl isocaproate	0.02	Aliphatic ester
Unknown	0.02	Unknown
α-Longipinene	0.07	Sesquiterpene
Citronellyl acetate	0.03	Monoterpenic ester
Longicyclene	0.02	Sesquiterpene
α-Ylangene	0.04	Sesquiterpene
α-Copaene	0.02	Sesquiterpene

Geranyl acetate	0.03	Monoterpenic ester
β-Longipinene	0.02	Sesquiterpene
Longifolene	0.25	Sesquiterpene
β-Caryophyllene	0.28	Sesquiterpene
trans-α-Bergamotene	0.03	Sesquiterpene
α-Himachalene	0.01	Sesquiterpene
α-Humulene	0.12	Sesquiterpene
(*E*)-β-Farnesene	0.04	Sesquiterpene
γ-Muurolene	0.01	Sesquiterpene
Germacrene D	0.01	Sesquiterpene
β-Selinene	0.02	Sesquiterpene
α-Selinene	0.03	Sesquiterpene
β-Himachalene	0.04	Sesquiterpene
α-Muurolene	0.01	Sesquiterpene
δ-Amorphene	0.04	Sesquiterpene
β-Bisabolene	0.47	Sesquiterpene
δ-Cadinene	0.02	Sesquiterpene
(*E*)-γ-Bisabolene	0.01	Sesquiterpene
α-Calacorene	0.01	Sesquiterpene
(*E*)-α-Bisabolene	0.06	Sesquiterpene
(*E*)-Nerolidol	0.02	Sesquiterpenic alcohol
Caryophyllene oxide	0.02	Sesquiterpenic ether
Unknown	0.01	Oxygenated sesquiterpene
(*Z*)-Abienol	0.01	Diterpenic alcohol
Consolidated total	**99.72**	

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

Note: no correction factor was applied

About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm is set to prioritize data from the most standard DB-5 column, and smallest values so as to avoid overestimating individual content. This process is semi-automatic. Advanced users are invited to consult the "Full analysis data" table after the chromatograms in this report to access the full untreated data and perform their own calculations if needed.

Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

Bracketed value ([xx]): A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

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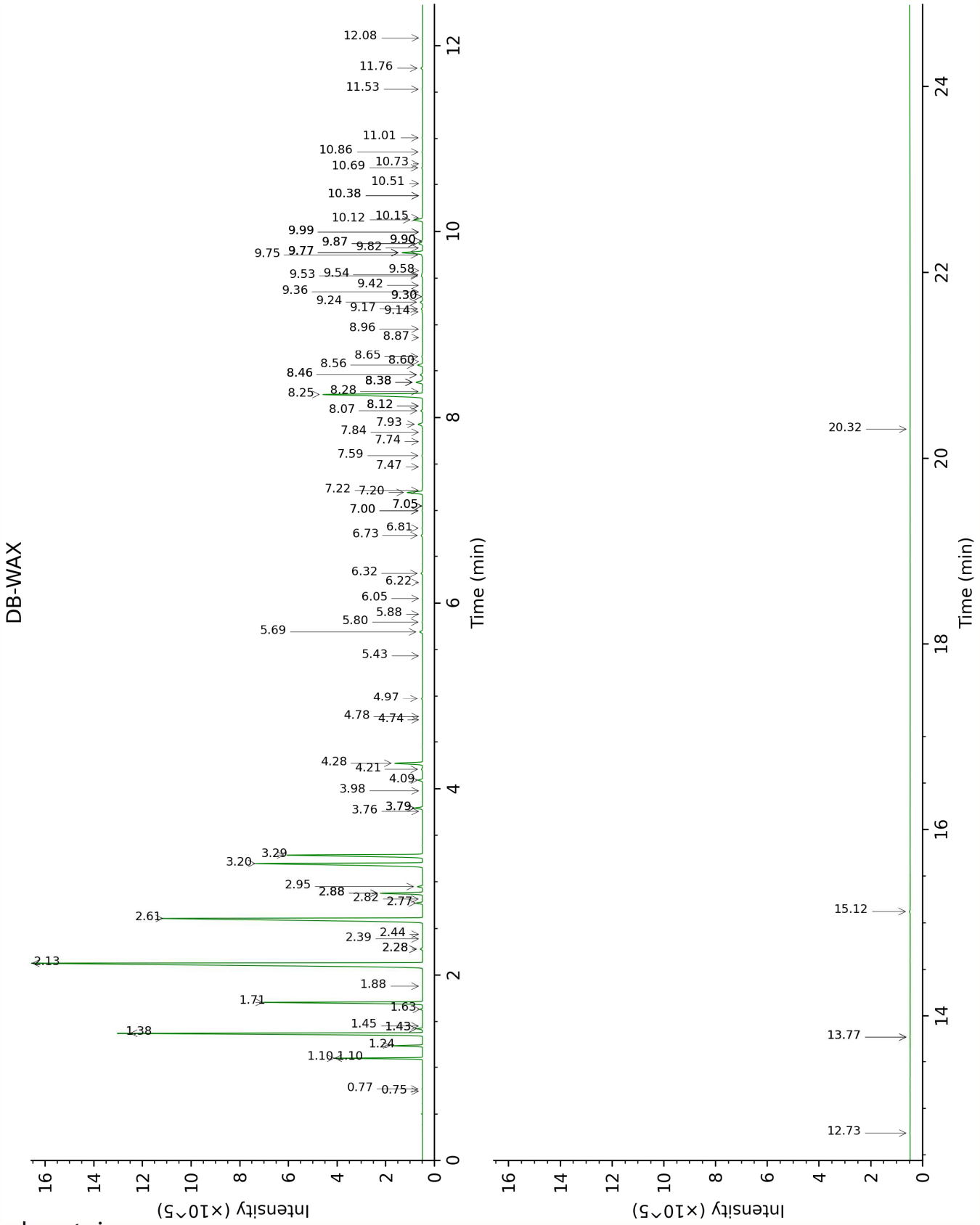
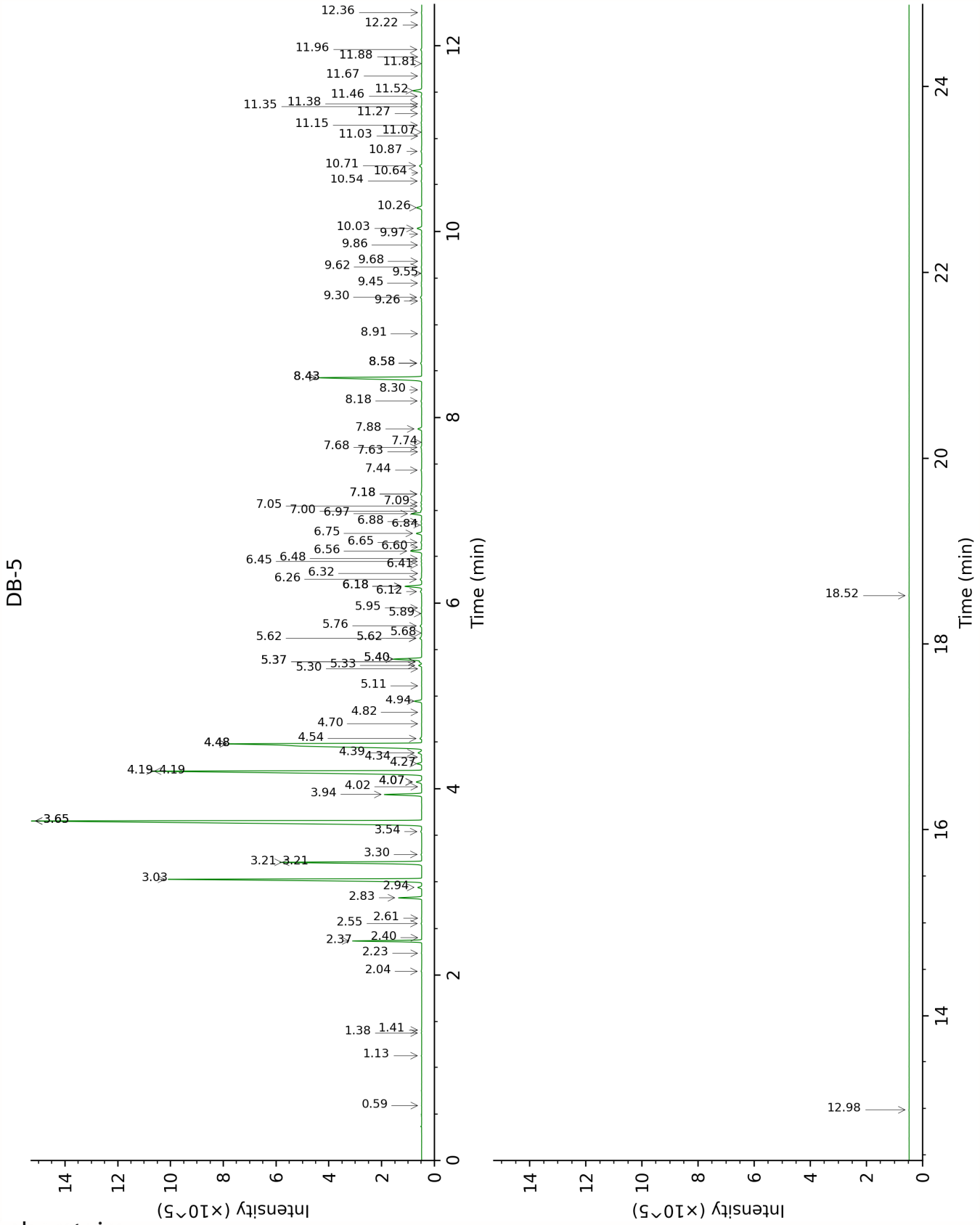

DB-WAX
Time (min)
Intensity (×10^5)
12.08
11.76
11.53
11.01
10.86
10.69
10.73
10.51
10.38
10.12
10.15
9.99
9.87
9.82
9.90
9.75
9.77
9.53
9.54
9.58
9.42
9.36
9.24
9.30
9.17
9.14
8.96
8.87
8.65
8.60
8.56
8.46
8.38
8.25
8.28
8.07
8.12
7.93
7.84
7.74
7.59
7.47
7.22
7.20
7.00
7.05
6.73
6.81
6.32
6.22
6.05
5.88
5.80
5.69
5.43
4.97
4.78
4.74
4.28
4.21
4.09
3.98
3.76
3.79
3.29
3.20
2.95
2.88
2.82
2.77
2.61
2.39
2.44
2.28
2.13
1.88
1.71
1.63
1.45
1.43
1.38
1.24
1.10
1.10
0.77
0.75
20.32
15.12
13.77
12.73


DB-5
Time (min)
Intensity (×10^5)
12.36
12.22
11.96
11.88
11.81
11.67
11.52
11.46
11.38
11.35
11.27
11.15
11.07
11.03
10.87
10.71
10.64
10.54
10.26
10.03
9.97
9.86
9.68
9.62
9.55
9.45
9.30
9.26
8.91
8.58
8.43
8.30
8.18
7.88
7.74
7.68
7.63
7.44
7.18
7.09
7.05
7.00
6.97
6.88
6.84
6.75
6.65
6.60
6.56
6.48
6.45
6.41
6.32
6.26
6.18
6.12
5.95
5.89
5.76
5.68
5.62
5.62
5.40
5.37
5.33
5.30
5.11
4.94
4.82
4.70
4.54
4.48
4.39
4.34
4.27
4.19
4.19
4.07
4.02
3.94
3.65
3.54
3.30
3.21
3.21
3.03
2.94
2.83
2.61
2.55
2.40
2.37
2.23
2.04
1.41
1.38
1.13
0.59
18.52
12.98

FULL ANALYSIS DATA

Isovaleral	Column DB-WAX			Column DB-5		
	0.75	881.9	tr	0.59	642.8	tr
Toluene	1.45	1003.4	0.01	1.13	759.0	0.01
Unknown ABBA IV [m/z 56, 45 (99), 41 (24), 84 (24), 69 (19), 43 (17)...]	0.77	890.6	0.01	1.38	795.7	0.01
Hexanal	1.88	1045.6	0.01	1.41	800.4	0.01
(3*Z*)-Hexenol	5.80	1350.6	0.03	2.04	855.7	0.03
Hexanol	5.44	1324.7	0.02	2.24	872.2	0.01
Santene	1.10*	949.0	[2.45]	2.37	883.5	2.45
Styrene	3.79*	1206.5	[0.34]	2.40	886.4	0.01
Unknown ABBA I [m/z 79, 93 (66), 94 (52), 91 (39), 77 (37), 122 (31)]	1.43*	1000.6	[0.19]	2.55	899.4	0.03
Bornylene	1.10*	949.0	[2.45]	2.61	904.3	0.01
Tricyclene	1.24	972.2	0.93	2.83	919.0	0.91
α-Thujene	1.43*	1000.6	[0.19]	2.94	926.5	0.17
α-Pinene	1.38	993.9	12.67	3.03	932.3	12.68
α-Fenchene	1.63	1021.1	0.08	3.21*	944.6	[6.31]
Camphene	1.71	1028.5	6.25	3.21*	944.6	[6.31]
Thuja-2,4(10)-diene	2.28*	1085.1	[0.10]	3.30	950.3	0.03
3,7,7-Trimethylcyclohepta-1,3,5-triene	2.88*	1135.0	[1.66]	3.54	966.8	0.05
β-Pinene	2.13	1070.1	27.38	3.66*	974.4	[27.59]
Sabinene	2.28*	1085.1	[0.10]	3.66*	974.4	[27.59]
Myrcene	2.88*	1135.0	[1.66]	3.94	993.7	1.63
2-Carene	2.39	1096.1	0.01	4.02	999.2	0.01
Pseudolimonene	2.82	1130.1	0.02	4.07*	1002.7	[0.29]
α-Phellandrene	2.77	1126.7	0.26	4.07*	1002.7	[0.29]
Δ3-Carene	2.61	1113.8	16.91	4.19*	1010.2	[16.93]
(3*Z*)-Hexenyl acetate	4.78	1278.6	0.01	4.19*	1010.2	[16.93]
α-Terpinene	2.95	1140.6	0.21	4.27	1015.3	0.21
Carvomenthene	2.44	1100.4	0.01	4.34	1019.7	0.02
para-Cymene	4.09	1228.5	0.21	4.39	1022.7	0.20
Limonene	3.20	1160.1	9.74	4.48*	1028.9	[16.73]
β-Phellandrene	3.29	1167.2	6.94	4.48*	1028.9	[16.73]
Benzyl alcohol	11.76	1819.1	0.10	4.54	1032.5	0.08
(*Z*)-β-Ocimene	3.76	1203.9	tr	4.70	1042.6	0.01
(*E*)-β-Ocimene	3.98	1220.0	0.01	4.82	1050.4	0.01
γ-Terpinene	3.79*	1206.5	[0.34]	4.94	1058.1	0.34
Unknown PIMA I	4.74	1276.0	0.01	5.11	1069.0	0.01

[m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]						
meta-Cymenene	6.22	1381.1	0.01	5.30	1080.7	0.01
Fenchone	5.69	1343.2	0.15	5.33	1083.1	0.14
Isoterpinolene	4.21	1237.0	0.06	5.37*	1085.6	[0.11]
γ-Campholenal	4.97	1293.1	0.07	5.37*	1085.6	[0.11]
para-Cymenene	6.32	1388.2	0.08	5.40*	1087.4	[1.35]
Terpinolene	4.28	1241.7	1.27	5.40*	1087.4	[1.35]
α-Thujone	6.05	1368.8	0.01	5.62*	1101.7	[0.11]
Linalool	8.07	1518.4	0.09	5.62*	1101.7	[0.11]
Nonanal	5.88	1356.8	0.01	5.68	1105.3	0.01
endo-Fenchol	8.38*	1542.0	[0.37]	5.76	1110.3	0.08
cis-para-Menth-2-en-1-ol	8.12*	1522.3	[0.03]	5.89	1118.9	0.02
α-Campholenal	7.00*	1438.1	[0.03]	5.95	1122.8	0.02
trans-Pinocarveol	9.17	1603.6	0.07	6.12	1134.3	0.07
trans-para-Menth-2-en-1-ol	8.96	1586.7	0.02	6.18*	1137.9	[0.82]
Camphor	7.20	1452.7	0.81	6.18*	1137.9	[0.82]
Camphene hydrate	8.46*	1548.3	[0.12]	6.26	1142.8	0.08
meta-Mentha-4,6-dien-8-ol	9.30*	1614.3	[0.04]	6.32	1147.0	0.02
Isoborneol	9.36	1618.4	0.02	6.41	1152.8	0.02
Pinocamphone	7.22	1454.3	0.03	6.45	1155.3	0.02
Pinocarvone	7.84	1500.6	0.03	6.48	1157.5	0.04
Borneol	9.77*	1652.3	[1.08]	6.56	1162.7	0.56
α-Phellandren-8-ol	10.15	1682.4	0.02	6.60	1165.4	0.02
Isopinocamphone	7.59	1481.9	0.05	6.65	1168.7	0.04
Terpinen-4-ol	8.56	1556.3	0.24	6.75	1175.0	0.26
Cryptone	9.14	1601.1	0.04	6.84	1181.2	0.04
para-Cymen-8-ol	11.53	1799.2	0.04	6.88	1183.8	0.04
α-Terpineol	9.77*	1652.3	[1.08]	6.97	1189.4	0.52
Myrtenal	8.66	1563.4	0.05	7.00	1191.1	0.04
Myrtenol	10.86	1742.1	0.04	7.05	1194.8	0.04
Methylchavicol	9.30*	1614.3	[0.04]	7.09	1197.2	0.04
Unknown ABBA V [m/z 93, 121 (98), 79 (64), 91 (41), 77 (35), 124 (24)...]	11.01	1754.9	0.03	7.18*	1203.1	[0.06]
Verbenone	9.58	1636.8	0.02	7.18*	1203.1	[0.06]
endo-Fenchyl acetate	6.81	1423.7	0.03	7.44	1220.5	0.04
Citronellol	10.73	1731.3	0.02	7.63	1234.0	0.01

Thymol methyl ether	8.46*	1548.3	[0.12]	7.68	1237.3	0.06
Carvone	9.99*	1670.0	[0.02]	7.74	1241.1	0.01
Piperitone	9.87*	1660.1	[0.21]	7.88	1251.0	0.20
Phellandral	9.90*	1662.4	[0.04]	8.18	1271.6	0.04
Isopulegyl acetate	8.12*	1522.3	[0.03]	8.30	1279.8	0.02
Bornyl acetate	8.25	1531.9	6.12	8.43*	1288.8	[5.99]
Isobornyl acetate	8.28	1534.3	0.03	8.43*	1288.8	[5.99]
Thymol	15.12	2133.4	0.04	8.58*	1299.5	[0.06]
2-Undecanone	8.60	1559.2	0.02	8.58*	1299.5	[0.06]
Isohexyl isocaproate	7.47	1473.0	0.02	8.91	1318.4	0.02
Unknown ABBA III [m/z 121, 93 (84), 43 (81), 79 (48), 117 (40), 56 (37)...]				9.26	1343.3	0.02
α-Longipinene	6.73	1417.9	0.09	9.30	1346.1	0.07
Citronellyl acetate	9.42	1624.0	0.03	9.45	1356.9	0.03
Longicyclene	7.05*	1441.9	[0.02]	9.55	1364.3	0.02
α-Ylangene	7.00*	1438.1	[0.03]	9.62	1369.2	0.04
α-Copaene	7.05*	1441.9	[0.02]	9.68	1373.5	0.02
Geranyl acetate	10.51	1712.7	0.01	9.86	1385.8	0.03
β-Longipinene	7.74	1493.1	0.02	9.97	1394.2	0.02
Longifolene	7.93	1507.3	0.27	10.03	1398.5	0.25
β-Caryophyllene	8.38*	1542.0	[0.37]	10.26	1414.7	0.28
trans-α-Bergamotene	8.38*	1542.0	[0.37]	10.54	1436.1	0.03
α-Himachalene	8.87	1579.7	0.02	10.64	1443.3	0.01
α-Humulene	9.24	1609.5	0.13	10.71	1448.9	0.12
(*E*)-β-Farnesene	9.53	1632.2	0.07	10.87	1460.6	0.04
γ-Muurolene	9.54	1633.2	0.04	11.03	1472.9	0.01
Germacrene D	9.75	1650.3	0.04	11.07	1476.0	0.01
β-Selinene	9.82	1656.3	0.02	11.15	1481.6	0.02
α-Selinene	9.90*	1662.4	[0.04]	11.27	1490.9	0.03
β-Himachalene	9.77*	1652.3	[1.08]	11.35	1496.6	0.04
α-Muurolene	9.99*	1670.0	[0.02]	11.38	1498.8	0.01
δ-Amorphene	9.87*	1660.1	[0.21]	11.46	1504.9	0.04
β-Bisabolene	10.12	1680.7	0.48	11.52	1509.6	0.47
δ-Cadinene	10.38*	1701.7	[0.02]	11.67	1522.0	0.02
(*E*)-γ-Bisabolene	10.38*	1701.7	[0.02]	11.81	1532.5	0.01
α-Calacorene	12.08	1847.9	0.01	11.88	1538.2	0.01
(*E*)-α-Bisabolene	10.69	1727.7	0.05	11.96	1544.4	0.06
(*E*)-Nerolidol	13.77*	2002.1	[0.01]	12.22	1565.3	0.02
Caryophyllene oxide	12.74	1905.9	0.02	12.36	1575.8	0.02
Unknown SAOF VI [m/z 41, 91 (78), 67 (76), 119 (70), 55	13.77*	2002.1	[0.01]	12.98	1626.5	0.01

(61)... 220 (7)]						
(*Z*)-Abienol	20.32	2708.8	0.01	18.52	2135.3	0.01
Total reported		99.40%			99.63%	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, only the first one is taken into account in the consolidated 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
R.T.: Retention time (minutes)
R.I.: Retention index

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