



GC/MS BATCH NUMBER: PF0101

ESSENTIAL OIL: PEPPERMINT WESTERN US

BOTANICAL NAME: MENTHA X PIPERITA

ORIGIN: USA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF PEPPERMINT WESTERN US OIL	%
MENTHOL	45.8
MENTHONE	8.0
MENTHYL ACETATE	5.4
1,8-CINEOLE	5.0
MENTHOFURAN	4.3
NEO-MENTHOL	2.8
ISOMENTHONE	2.7
β -CARYOPHYLLENE	1.8
LIMONENE + β -PHELLANDRENE	1.6
GERMACRENE D	1.6
PULEGONE	1.1

Comments from Robert Tisserand: Excellent fresh, mint candy odor profile. All twelve key ISO constituents are within range except for sabinyl acetate, which is typical for Peppermint oil.

Date : May 29, 2017

SAMPLE IDENTIFICATION

Internal code : 17E19-PTH16-1-DM

Customer identification : Peppermint West - USA - PF010156R

Type : Essential oil

Source : *Mentha x piperita*

Customer : Plant Therapy

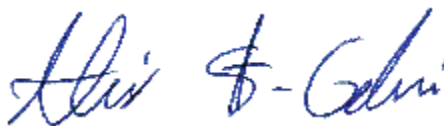
ANALYSIS

Method : PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

Analyst : Sylvain Mercier, M. Sc., chimiste

Analysis date : 2017-05-29

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.	
Ethanol	0.35	632	0.02	0.02	790	0.66	Aliphatic alcohol
Isovaleral	0.67	674	0.03	0.03	749	0.62	Aliphatic aldehyde
2-Methylbutyral	0.71	679	0.02	0.01	741	0.61	Aliphatic aldehyde
Isoamyl alcohol	1.14	736	0.03	1.46	1141	2.72*	Aliphatic alcohol
2-Methylbutyl alcohol	1.16	739	0.04	[1.46]	1141	2.72*	Aliphatic alcohol
cis-Hex-3-en-1-ol	2.47	864	0.04	0.02	1324	5.26	Aliphatic alcohol
Hexanol	2.70	882	0.02	0.01	1299	4.90	Aliphatic alcohol
2,5-Diethyltetrahydrofuran	2.91	898	0.02	0.01	972	1.21	Furan
α -Thujene	3.31	922	0.04	0.05	954	1.12	Monoterpene
α -Pinene	3.41	929	0.63	0.59	944	1.08	Monoterpene
Camphene	3.70	946	0.02	0.02	1008	1.35	Monoterpene
3-Methylcyclohexanone	4.01	964	0.02	0.02	1246	4.13	Aliphatic ketone
Sabinene	4.13	971	0.44	0.42	1060	1.85	Monoterpene
β -Pinene	4.19	975	0.91	0.85	1044	1.69	Monoterpene
Myrcene	4.46*	991	0.32	0.19	1116	2.39	Monoterpene
Octen-3-ol	4.46*	991	[0.32]	0.15	1398	6.42	Aliphatic alcohol
α -Phellandrene	4.75*	1008	0.27	0.01	1111	2.33	Monoterpene
Octan-3-ol	4.75*	1008	[0.27]	0.26	1346	5.61	Aliphatic alcohol
Δ 3-Carene	4.75*	1008	[0.27]	0.01	1109	2.31	Monoterpene
α -Terpinene	4.93	1017	0.21	0.19	1123	2.48	Monoterpene
para-Cymene	5.12	1028	0.12	0.12	1207	3.58	Monoterpene
Limonene	5.16*	1030	1.60	[1.46]	1141	2.72*	Monoterpene
β -Phellandrene	5.16*	1030	[1.60]	[1.46]	1141	2.72*	Monoterpene
1,8-Cineole	5.23	1033	4.99	5.14	1147	2.80	Monoterp. ether
cis- β -Ocimene	5.33	1039	0.28	0.20	1185	3.29	Monoterpene
trans- β -Ocimene	5.51	1049	0.08	0.06	1201	3.49	Monoterpene
γ -Terpinene	5.70	1059	0.37	0.41	1186	3.31	Monoterpene
cis-Linalool oxide (fur.)	5.97	1074	0.01	0.01	1376	6.08	Monoterp. alcohol
cis-Sabinene hydrate	6.01	1076	0.93	1.13	1407	6.57*	Monoterp. alcohol
Terpinolene	6.18	1085	0.14	0.11	1223	3.79	Monoterpene
trans-Linalool oxide (fur.)	6.29	1092	0.01	[1.13]	1407	6.57*	Monoterp. alcohol
Linalool	6.63	1107	0.37	0.42	1494	8.48*	Monoterp. alcohol
cis-para-Menth-2-en-1-ol	7.17	1126	0.08	[0.42]	1494	8.48*	Monoterp. alcohol
Isopulegol	7.77	1149	0.16	[0.42]	1494	8.48*	Monoterp. alcohol
Menthone	8.06	1159	17.98	18.02	1394	6.35	Monoterp. ketone
Menthofuran	8.17	1163	4.27	3.97	1410	6.61	Monoterp. ether
Isomenthone	8.26	1166	2.72	2.74	1417	6.71*	Monoterp. ketone
neo-Menthol	8.45	1174	2.84	2.85	1534	9.57	Monoterp. alcohol
Borneol	8.52	1176	0.09	1.51	1625	12.88*	Monoterp. alcohol
trans-Isopulegone	8.57	1178	0.17	5.65	1500	8.64*	Monoterp. ketone
Menthol	9.00*	1194	46.08	45.76	1581	11.28	Monoterp. alcohol

Terpinen-4-ol	9.00*	1194	[46.08]	0.71	1531	9.45	Monoterp. alcohol
Isomenthol	9.10	1197	0.53	0.54	1557	10.39	Monoterp. alcohol
neoiso-Menthol	9.25	1202	0.17	0.70	1628	12.98*	Monoterp. alcohol
α-Terpineol	9.40	1205	0.22	[0.70]	1628	12.98*	Monoterp. alcohol
Pulegone	10.91	1238	1.07	1.05	1552	10.20	Monoterp. ketone
Carvone	11.29	1247	0.05	0.03	1636	13.39	Monoterp. ketone
Piperitone	11.67	1255	0.46	[0.70]	1628	12.98*	Monoterp. ketone
neo-Menthyl acetate	12.32	1270	0.25	0.23	1464	7.77	Monoterp. ester
Menthyl acetate	13.33	1292	5.42	[5.65]	1500	8.64*	Monoterp. ester
Isomenthyl acetate	13.94	1304	0.21	0.24	1509	8.85	Monoterp. ester
Bicycloelemene	14.40	1311	0.04	[2.74]	1417	6.71*	Sesquiterpene
Menthofuro lactone	16.77	1347	0.04				Monoterp. lactone
Eugenol	17.30	1355	0.02	0.05	2061	37.73	Phenylpropanoid
α-Copaene	17.60	1359	0.03	0.05	1425	6.87	Sesquiterpene
β-Bourbonene	18.01	1366	0.20	0.25	1452	7.51	Sesquiterpene
β-Elemene	18.79	1378	0.06	1.90	1524	9.21*	Sesquiterpene
β-Caryophyllene	20.48	1403	1.82	[1.90]	1524	9.21*	Sesquiterpene
β-Copaene	21.36	1413	0.05	0.07	1503	8.72	Sesquiterpene
α-Humulene	23.20	1435	0.07	0.13	1585	11.43	Sesquiterpene
trans-β-Farnesene	24.37	1449	0.25	0.26	1618	12.62	Sesquiterpene
Germacrene D	25.44	1462	1.56	[1.51]	1625	12.88*	Sesquiterpene
Bicyclogermacrene	26.64	1477	0.26	0.24	1644	13.77	Sesquiterpene
δ-Cadinene	29.09	1507	0.05	0.05	1674	15.32	Sesquiterpene
Viridiflorol	34.53	1583	0.13	0.13	1982	34.44	Sesquiterp. alcohol
Total identified			99.33%	99.05%			

*: 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

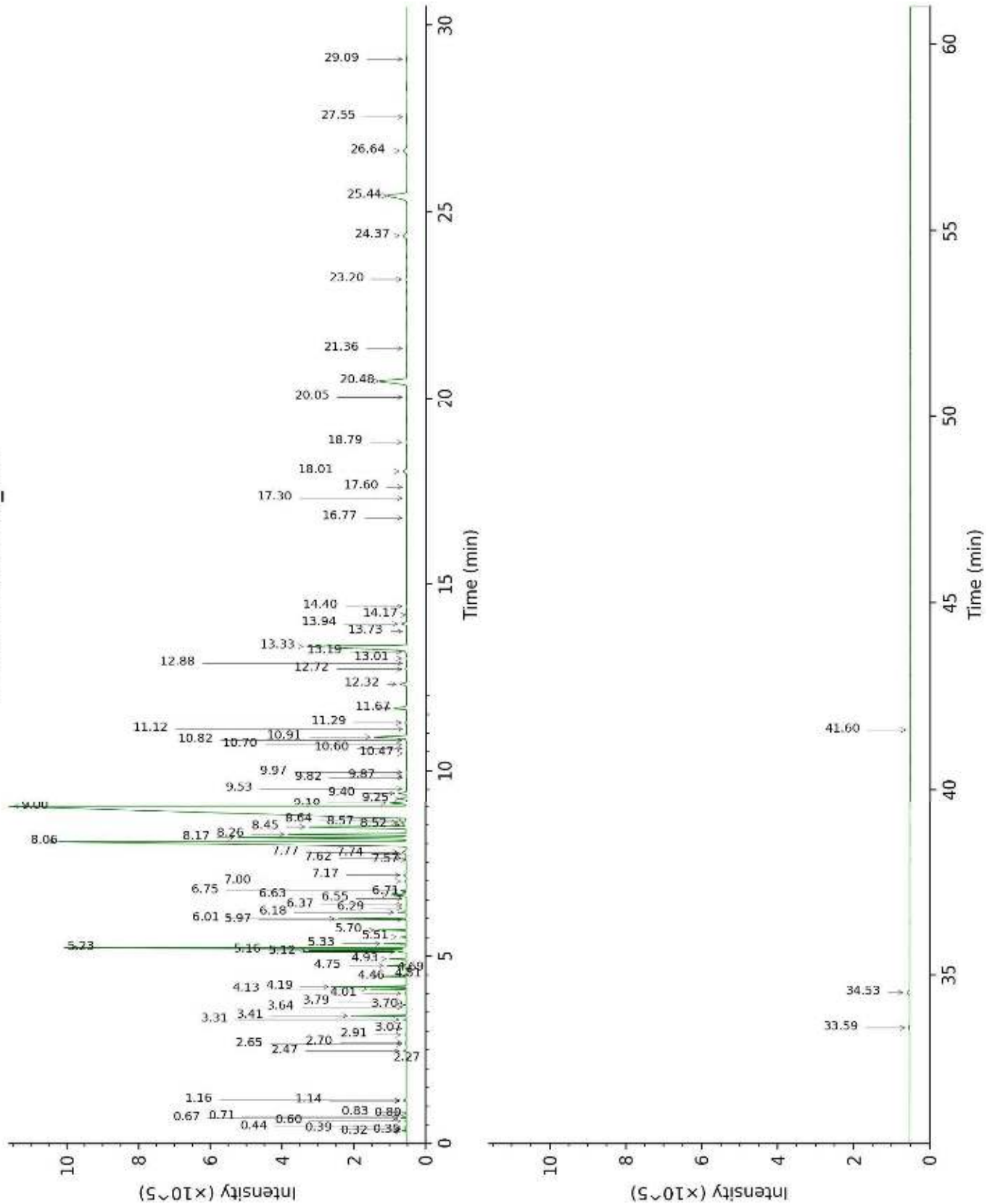
Physical aspect : Clear liquid

Refractive index : 1.4605 ± 0.0003 (20 °C)

CONCLUSION

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

17E19-PTH16-1-DM_BP5



17E19-PTH16-1-DM_WAX

