



GC/MS BATCH NUMBER: S40103

ESSENTIAL OIL: SPEARMINT ORGANIC
BOTANICAL NAME: MENTHA SPICATA
ORIGIN: INDIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF SPEARMINT ORGANIC OIL	%
CARVONE	59.6
LIMONENE	20.8
MYRCENE	1.9
1,8-CINEOLE	1.6
cis-DIHYDROCARVONE + α -TERPINEOL	1.6
β -BOURBONENE	1.1
α -PINENE	1.1

Date : December 15, 2017

SAMPLE IDENTIFICATION

Internal code : 17L14-PTH7-1-CC

Customer identification : Spearmint Organic - India - S4010378R

Type : Essential oil

Source : *Mentha spicata*

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 : 2017-12-15

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.	
Isovaleral	0.67	674	0.02	0.03	726	0.61*	Aliphatic aldehyde
2-Methylbutyral	0.71	678	0.01	[0.03]	726	0.61*	Aliphatic aldehyde
Isoamyl alcohol	1.17	739	0.01	22.66	1144	2.86*	Aliphatic alcohol
2-Methylbutyl alcohol	1.19	743	0.01	[22.66]	1144	2.86*	Aliphatic alcohol
Methyl 2-methylbutyrate	1.41	771	0.01	0.01	909	0.98	Aliphatic ester
Ethyl 2-methylbutyrate	2.26	847	0.01	0.02	1000	1.39*	Aliphatic ester
cis-Hex-3-en-1-ol	2.52	867	0.01	0.01	1316	5.30	Aliphatic alcohol
2,5-Diethyltetrahydrofuran	2.91	896	0.09	0.15	973	1.24	Furan
Hashishene	3.21	914	0.11	1.18	945	1.12*	Monoterpene
α -Thujene	3.32	921	0.06	[1.18]	945	1.12*	Monoterpene
α -Pinene	3.43	927	1.11	[1.18]	945	1.12*	Monoterpene
Camphene	3.72	944	0.03	[0.02]	1000	1.39*	Monoterpene
Thuja-2,4(10)-diene	3.81	949	0.01	0.60	1053	1.91*	Monoterpene
3-Methylcyclohexanone	4.01	962	0.16	0.12	1238	4.16	Aliphatic ketone
Sabinene	4.15	969	0.54	[0.60]	1053	1.91*	Monoterpene
β -Pinene	4.21	973	0.97	0.89	1038	1.74	Monoterpene
Myrcene	4.49*	990	1.76	1.94	1115	2.48*	Monoterpene
Octen-3-ol	4.49*	990	[1.76]	0.32	1400	6.62*	Aliphatic alcohol
Octan-3-one	4.54	992	0.08	0.09	1194	3.51	Aliphatic ketone
Pseudolimonene	4.71	1002	0.06	[1.94]	1115	2.48*	Monoterpene
α -Phellandrene	4.76*	1005	0.07	[1.94]	1115	2.48*	Monoterpene
Δ^3 -Carene	4.76*	1005	[0.07]	0.01	1079	2.23	Monoterpene
Octan-3-ol	4.84	1009	0.43	0.44	1339	5.68	Aliphatic alcohol
Octanal	4.89	1012	0.02	0.02	1229	4.01	Aliphatic aldehyde
α -Terpinene	4.96	1016	0.15	[1.94]	1115	2.48*	Monoterpene
Limonene	5.24*	1031	21.01	[22.66]	1144	2.86*	Monoterpene
para-Cymene	5.24*	1031	[21.01]	0.26	1206	3.67	Monoterpene
1,8-Cineole	5.27	1032	1.60	[22.66]	1144	2.86*	Monoterp. ether
cis- β -Ocimene	5.37	1038	0.07	0.33	1187	3.42*	Monoterpene
trans- β -Ocimene	5.54	1048	0.04	0.03	1199	3.59	Monoterpene
γ -Terpinene	5.73	1058	0.26	[0.33]	1187	3.42*	Monoterpene
cis-Sabinene hydrate	6.08	1077	0.31	[0.32]	1400	6.62*	Monoterp. alcohol
Terpinolene	6.21*	1084	0.15	0.09	1222	3.90	Monoterpene
Octanol	6.21*	1084	[0.15]	0.11	1495	8.83*	Aliphatic alcohol
para-Cymenene	6.44	1096	0.04	0.07	1361	6.01	Monoterpene
Octen-3-yl acetate	6.72*	1107	0.09	0.01	1333	5.58	Aliphatic ester
Linalool	6.72*	1107	[0.09]	0.07	1486	8.61	Monoterp. alcohol
Octan-3-yl acetate	7.02	1118	0.11	0.11	1289	4.90	Aliphatic ester
trans-para-Mentha-2,8-dien-1-ol	7.25	1126	0.07	1.07	1563	11.15*	Monoterp. alcohol
cis-Limonene oxide	7.36	1130	0.02	0.07	1377	6.26	Monoterp. ether

<i>trans</i> -Limonene oxide	7.48	1135	0.06	0.24	1382	6.35*	Monoterp. ether
<i>trans</i> -Pinocarveol	7.66	1141	0.06	[1.07]	1563	11.15*	Monoterp. alcohol
<i>trans</i> -para-Menth-2-en-1-ol	7.71	1143	0.01	[1.07]	1563	11.15*	Monoterp. alcohol
Isopulegol	7.87	1149	0.02	[0.11]	1495	8.83*	Monoterp. alcohol
Menthone	8.04	1155	0.20	[0.24]	1382	6.35*	Monoterp. ketone
Isomenthone	8.30	1164	0.06	0.06	1408	6.76	Monoterp. ketone
neo-Menthol	8.59	1175	0.07	1.93	1521	9.61*	Monoterp. alcohol
<i>trans</i> -Isopulegone	8.69	1179	0.10	0.14	1507	9.11*	Monoterp. ketone
Terpinen-4-ol	8.85	1184	0.63	[1.93]	1521	9.61*	Monoterp. alcohol
Menthol	8.92	1187	0.93	[1.07]	1563	11.15*	Monoterp. alcohol
<i>cis</i> -Dihydrocarvone	9.54*	1205	1.55	[1.93]	1521	9.61*	Monoterp. ketone
α -Terpineol	9.54*	1205	[1.55]	61.54	1631	13.98*	Monoterp. alcohol
Dihydrocarveol	9.67	1208	0.15	0.13	1662	15.57	Monoterp. alcohol
neo-Dihydrocarveol	9.72	1209	0.36	0.24	1679	16.50	Monoterp. alcohol
<i>trans</i> -Dihydrocarvone	9.79	1210	0.18	[1.93]	1521	9.61*	Monoterp. ketone
<i>trans</i> -Carveol	10.89	1234	0.45	0.39	1743	20.21	Monoterp. alcohol
Pulegone	11.04	1238	0.02	0.04	1546	10.51	Monoterp. ketone
Carvone	11.88*	1256	59.79	[61.54]	1631	13.98*	Monoterp. ketone
<i>cis</i> -Carveol	11.88*	1256	[59.79]	0.19	1770	22.01	Monoterp. alcohol
Piperitone	12.02	1259	0.21	[61.54]	1631	13.98*	Monoterp. ketone
Isopiperitenone	12.47	1269	0.05	0.08	1719	18.67	Monoterp. ketone
Dihydroedulan I	13.17*	1285	0.15	0.11	1444	7.62	Edulan
Menthyl acetate	13.17*	1285	[0.15]	[0.14]	1507	9.11*	Monoterp. ester
<i>trans</i> -Dihydrocarvyl acetate	15.51	1324	0.23	0.50	1594	12.30*	Monoterp. ester
α -Copaene	17.80*	1359	0.27	0.07	1431	7.32	Sesquiterpene
1,5-diepi- β -Bourbonene	17.80*	1359	[0.27]	0.04	1471	8.25	Sesquiterpene
<i>cis</i> -Carvyl acetate	17.80*	1359	[0.27]	0.41	1642	14.54	Monoterp. ester
β -Bourbonene	18.23	1365	1.14	1.15	1454	7.84	Sesquiterpene
β -Elemene	19.01	1377	0.09	[1.93]	1521	9.61*	Sesquiterpene
β -Ylangene	20.32	1397	0.18				Sesquiterpene
β -Caryophyllene	20.70	1401	0.89	1.42	1514	9.36*	Sesquiterpene
β -Copaene	21.61	1412	0.14	[1.42]	1514	9.36*	Sesquiterpene
<i>cis</i> - β -Farnesene	22.64	1425	0.11	[0.50]	1594	12.30*	Sesquiterpene
α -Humulene	23.36	1433	0.02	[0.50]	1594	12.30*	Sesquiterpene
<i>trans</i> - β -Farnesene	24.60	1448	0.50	[61.54]	1631	13.98*	Sesquiterpene
Germacrene D	25.73	1461	0.51	[61.54]	1631	13.98*	Sesquiterpene
δ -Cadinene	29.45	1507	0.05	0.04	1672	16.11	Sesquiterpene
Caryophyllene oxide	33.91	1570	0.05	0.05	1841	26.87	Sesquiterp. ether
Viridiflorol	34.95	1584	0.11	0.11	1971	34.92	Sesquiterp. alcohol
Total identified			98.84%	99.59%			

*: 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

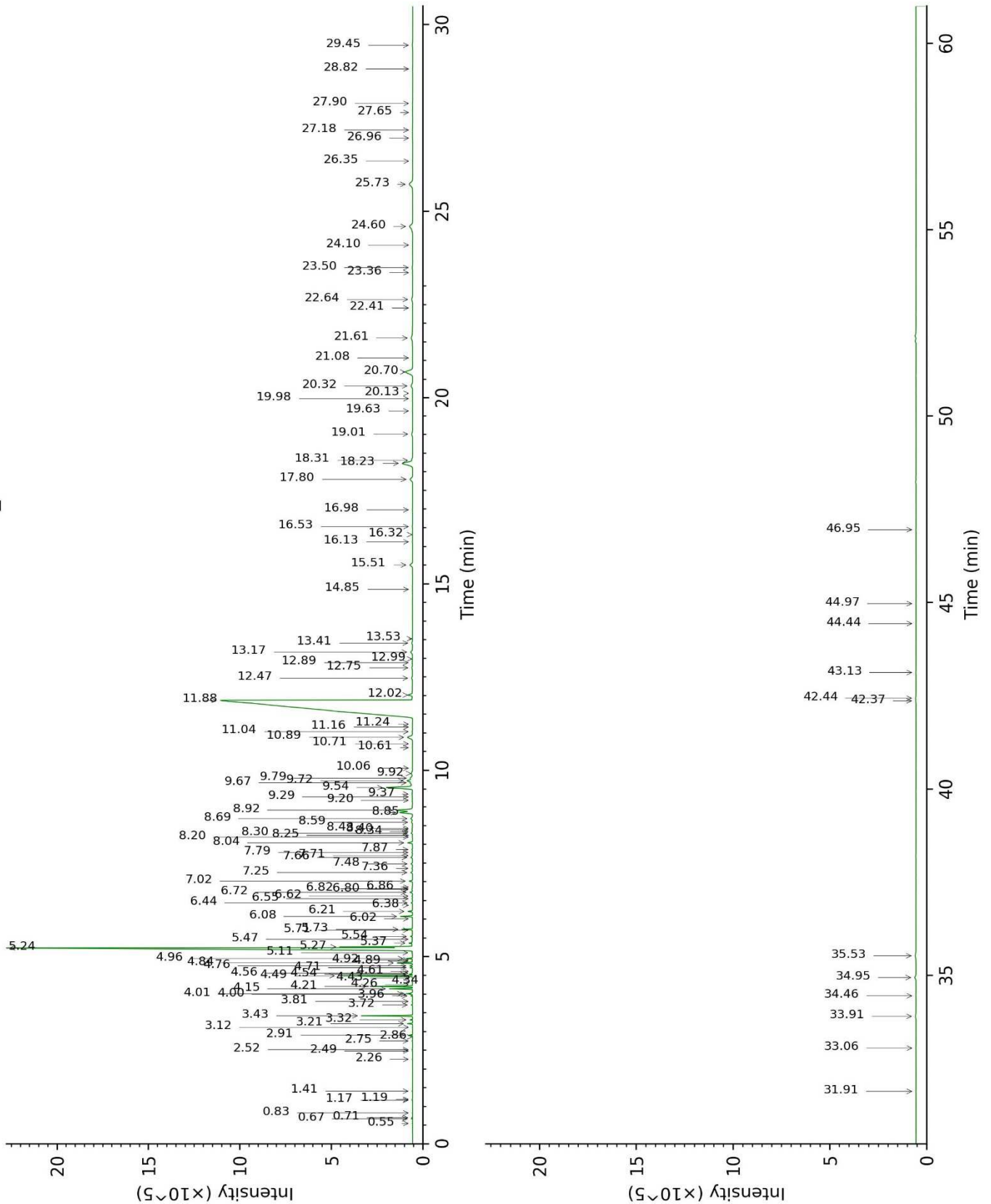
Physical aspect : Light yellow liquid

Refractive index : 1.4883 ± 0.0003 (20 °C)

CONCLUSION

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

17L14-PTH7-1-CC_BP5



17L14-PTH7-1-CC_WAX

