



PLANT THERAPY  
100% PURE ESSENTIAL OILS

## GC/MS BATCH NUMBER: S30103

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**ESSENTIAL OIL:** SPEARMINT  
**BOTANICAL NAME:** MENTHA SPICATA  
**ORIGIN:** USA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF SPEARMINT OIL	%
CARVONE + PIPERITONE	66.6
LIMONENE	10.0
MYRCENE	2.3
1,8-CINEOLE	1.6
$\beta$ -CARYOPHYLLENE	1.4
GERMACRENE D	1.3
$\beta$ -BOURBONENE	1.2
$\alpha$ -TERPINEOL	1.1
cis-DIHYRDOCARVONE	1.1
cis-SABINENE HYDRATE	1.1

Comments from Robert Tisserand: A classic Spearmint odor, this oil narrowly misses on a couple of ISO standards, but I believe it is a genuine oil.

**Date :** December 14, 2016

*SAMPLE IDENTIFICATION*

**Internal code :** 16L06-PTH1-1-DM

**Customer identification :** Spearmint - S3010368R

**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).

**Analyst :** Alexis St-Gelais, M. Sc., chimiste

**Analysis date :** 2016-12-09

Checked and approved by :

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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	0.34	497	0.04	0.04	788	0.50	Aliphatic alcohol
Isovaleral	0.65	610	0.12	0.14	771	0.48	Aliphatic aldehyde
2-Methylbutyral	0.68	620	0.07	0.05	767	0.47	Aliphatic aldehyde
Isoamyl alcohol	1.15	729	0.04	11.66	1146	2.34*	Aliphatic alcohol
2-Methylbutyl alcohol	1.18	733	0.03	0.05	1138	2.25	Aliphatic alcohol
Methyl 2-methylbutyrate	1.38	761	0.02	0.02	916	0.74	Aliphatic ester
Ethyl 2-methylbutyrate	2.23	845	0.02	0.01	1001	1.09	Aliphatic ester
cis-Hex-3-en-1-ol	2.43	860	0.04	0.03	1337	4.84*	Aliphatic alcohol
trans-Hex-2-en-1-ol	2.70	881	0.02	0.02	1365	5.25	Aliphatic alcohol
Hexanol	2.75	885	0.02	0.02	1300	4.32	Aliphatic alcohol
2,5-Diethyltetrahydrofuran	2.87	894	0.08	0.07	970	0.96	Furan
Hashishene	3.17	913	0.12	0.60	950	0.88*	Monoterpene
α-Thujene	3.27	919	0.05	0.06	947	0.87	Monoterpene
α-Pinene	3.38	926	0.50	[0.60]	950	0.88*	Monoterpene
Camphene	3.66	943	0.02	0.02	1013	1.16	Monoterpene
Sabinene	4.10	969	0.41	0.38	1058	1.52	Monoterpene
β-Pinene	4.16	973	0.58	0.54	1042	1.39	Monoterpene
Myrcene	4.45	991	2.30	2.27	1117	2.00	Monoterpene
Octan-3-one	4.49	993	0.04	0.08	1203	3.00	Aliphatic ketone
α-Phellandrene	4.66	1003	0.03	0.34	1125	2.09*	Monoterpene
Octan-3-ol	4.82	1012	0.91	0.90	1342	4.92	Aliphatic alcohol
α-Terpinene	4.90	1016	0.32	[0.34]	1125	2.09*	Monoterpene
Limonene	5.16	1031	10.03	[11.66]	1146	2.34*	Monoterpene
1,8-Cineole	5.20	1033	1.63	[11.66]	1146	2.34*	Monoterp. ether
cis-β-Ocimene	5.31	1039	0.19	0.11	1188	2.83	Monoterpene
trans-β-Ocimene	5.49	1049	0.09	0.06	1207	3.04	Monoterpene
γ-Terpinene	5.68	1059	0.56	0.60	1190	2.86	Monoterpene
cis-Sabinene hydrate	6.05	1079	1.13	1.15	1402	5.79	Monoterp. alcohol
Terpinolene	6.15	1085	0.15	0.13	1226	3.30	Monoterpene
Octanol	6.22	1088	0.03	0.02	1501	7.58	Aliphatic alcohol
para-Cymenene	6.38	1097	0.03	0.04	1383	5.50	Monoterpene
trans-Sabinene hydrate	6.57	1104	0.03	1.24	1476	7.10*	Monoterp. alcohol
Linalool	6.69	1109	0.20	0.16	1484	7.25	Monoterp. alcohol
Nonanal	6.74	1110	0.02	[0.03]	1337	4.84*	Aliphatic aldehyde
Octan-3-yl acetate	6.97	1119	0.26	0.26	1293	4.22	Aliphatic ester
trans-para-Mentha-2,8-dien-1-ol	7.21	1128	0.10	0.04	1565	9.24	Monoterp. alcohol
cis-Limonene oxide	7.29	1131	0.02	0.01	1371	5.33	Monoterp. ether
trans-Limonene oxide	7.41	1135	0.05	0.06	1390	5.61*	Monoterp. ether
trans-Pinocarveol	7.62	1143	0.08	0.02	1560	9.08	Monoterp. alcohol
Camphor	7.74	1148	0.04	0.03	1431	6.25	Monoterp. ketone

Menthone	7.83	1151	0.02	[0.06]	1390	5.61*	Monoterp. ketone
Isomenthone	8.28	1168	0.04	0.02	1422	6.08	Monoterp. ketone
Borneol	8.56*	1179	0.06	0.05	1608	10.53*	Monoterp. alcohol
Terpinen-4-ol	8.78*	1186	1.01	1.24	1526	8.08*	Monoterp. alcohol
Menthol	8.78*	1186	[1.01]	0.17	1575	9.55	Monoterp. alcohol
<i>cis</i> -Dihydrocarvone	9.43*	1205	1.38	1.11	1519	7.90*	Monoterp. ketone
$\alpha$ -Terpineol	9.43*	1205	[1.38]	0.24	1626	11.07	Monoterp. alcohol
Dihydrocarveol	9.62	1209	0.44	0.39	1682	13.53	Monoterp. alcohol
neo-Dihydrocarveol	9.73	1212	0.27	0.25	1665	12.77	Monoterp. alcohol
<i>trans</i> -Dihydrocarvone	9.89	1215	0.16	0.18	1529	8.19	Monoterp. ketone
<i>trans</i> -Carveol	10.89	1238	0.36	0.36	1746	16.58	Monoterp. alcohol
Carvone	11.78*	1258	66.57	69.61	1638	11.60*	Monoterp. ketone
Piperitone	11.78*	1258	[66.57]	[69.61]	1638	11.60*	Monoterp. ketone
<i>cis</i> -Carveol	11.91	1261	0.16	0.28	1772	18.08	Monoterp. alcohol
Isopiperitenone	12.36	1270	0.06	0.07	1724	15.37	Monoterp. ketone
Menthyl acetate	13.03	1285	0.17	[1.11]	1519	7.90*	Monoterp. ester
<i>trans</i> -Dihydrocarvyl acetate	15.35	1324	0.30	0.35	1598	10.25	Monoterp. ester
<i>cis</i> -Carvyl acetate	17.65	1359	0.38	0.44	1645	11.92	Monoterp. ester
$\beta$ -Bourbonene	18.00*	1365	1.82	[1.24]	1476	7.10*	Sesquiterpene
1,5-diepi- $\beta$ -Bourbonene	18.00*	1365	[1.82]	0.60	1473	7.05	Sesquiterpene
( <i>Z</i> )-Jasmone	20.16	1397	0.41	0.40	1822	20.95	Jasmonate
$\beta$ -Caryophyllene	20.44*	1401	1.40	1.39	1538	8.45*	Sesquiterpene
$\beta$ -Copaene	21.32	1411	0.19	[1.24]	1526	8.08*	Sesquiterpene
Aromadendrene	22.37	1424	0.17	[1.24]	1526	8.08*	Sesquiterpene
$\alpha$ -Humulene	23.19*	1434	0.08	0.07	1589	9.96*	Sesquiterpene
<i>trans</i> - $\beta$ -Farnesene	24.38	1448	0.86	[69.61]	1638	11.60*	Sesquiterpene
Germacrene D	25.44*	1461	1.29	[69.61]	1638	11.60*	Sesquiterpene
$\delta$ -Cadinene	29.13	1506	0.06	0.03	1675	13.21	Sesquiterpene
Caryophyllene oxide	33.69	1568	0.04	0.03	1853	22.95	Sesquiterp. ether
Viridiflorol	34.79	1584	0.26	0.24	1983	31.37	Sesquiterp. alcohol
<b>Total identified</b>			<b>98.38%</b>	<b>98.75%</b>			

\*: 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 :** 1.4868  $\pm$  0.0003 (20 °C)

#### CONCLUSION

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



