

GC/MS BATCH NUMBER: P40103

ESSENTIAL OIL: ORGANIC PEPPERMINT
BOTANICAL NAME: MENTHA X PIPERITA
ORIGIN: INDIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF ORGANIC PEPPERMINT OIL	%
MENTHOL	32.7
MENTHONE	26.1
MENTHYL ACETATE	6.1
ISOMENTHONE	4.7
1,8-CINEOLE	4.6
MENTHOFURAN	3.9
NEOMENTHOL	3.7
LIMONENE	2.8
β-CARYOPHYLLENE	2.4
PULEGONE	1.6
β-PINENE	1.2
(E)-SABINENE HYDRATE	0.3
OCTAN-3-OL	0.2

Comments from Robert Tisserand: Very good odor quality. Conforms to 11 of 12 key ISO constituents. (E)-Sabinene hydrate is almost always low in Peppermint oils compared to the ISO standard.

Date : August 1, 2016

SAMPLE IDENTIFICATION

Internal code : 16G22-PTH7-1-SM

Customer identification : Org Peppermint - India - P4010366R

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 : 2016-08-01

Checked and approved by :

Sylvain Mercier, M. Sc., chimiste 2014-005

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IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
<i>cis</i> -Hex-3-en-1-ol	2.50	870	0.01	0.01	1325	4.75	Aliphatic alcohol
2,5-Diethyltetrahydrofuran	2.84	897	0.03	0.03	969	0.98	Furan
α -Thujene	3.24	922	0.04	0.10	952	0.91	Monoterpene
α -Pinene	3.34	929	0.82	0.76	944	0.88	Monoterpene
Camphene	3.63	946	0.03	0.02	998	1.10	Monoterpene
Thuja-2,4(10)-diene	3.72	952	0.01	0.44	1055	1.53*	Monoterpene
3-Methylcyclohexanone	3.95	965	0.03	0.03	1251	3.71	Aliphatic ketone
Sabinene	4.06	972	0.47	[0.44]	1055	1.53*	Monoterpene
β -Pinene	4.12	976	1.22	1.15	1038	1.39	Monoterpene
Myrcene	4.40	993	0.21	0.20	1113	2.02	Monoterpene
Octan-3-one	4.45	996	0.02	0.03	1196	2.99	Aliphatic ketone
Octen-3-ol	4.50	999	0.06	3.94	1409	5.98*	Aliphatic alcohol
α -Phellandrene	4.67*	1008	0.03	0.02	1108	1.96	Monoterpene
Δ^3 -Carene	4.67*	1008	[0.03]	0.02	1107	1.95	Monoterpene
Octan-3-ol	4.77	1014	0.19	0.18	1347	5.07	Aliphatic alcohol
α -Terpinene	4.86	1019	0.20	0.18	1120	2.10	Monoterpene
para-Cymene	5.06	1030	0.16	0.21	1207	3.10	Monoterpene
Limonene	5.09	1032	2.75	2.20	1139	2.32	Monoterpene
1,8-Cineole	5.16	1035	4.60	4.92	1144	2.38	Monoterp. ether
<i>cis</i> - β -Ocimene	5.27	1042	0.17	0.46	1186	2.87*	Monoterpene
<i>trans</i> - β -Ocimene	5.45	1052	0.04	0.04	1200	3.04	Monoterpene
γ -Terpinene	5.63	1062	0.35	[0.46]	1186	2.87*	Monoterpene
<i>cis</i> -Sabinene hydrate	5.99	1081	0.27	[3.94]	1409	5.98*	Monoterp. alcohol
Terpinolene	6.10	1088	0.11	0.10	1222	3.32	Monoterpene
para-Cymenene	6.32	1100	0.01	0.01	1376	5.50	Monoterpene
Linalool	6.64	1112	0.23	0.24	1491	7.53	Monoterp. alcohol
Camphor	7.71	1153	0.06	0.07	1434	6.43	Monoterp. ketone
Isopulegol	7.75	1154	0.12	6.19	1500	7.71*	Monoterp. alcohol
Menthone	7.99	1163	26.07	26.46	1395	5.77	Monoterp. ketone
Menthofuran	8.08	1167	3.92	[3.94]	1409	5.98*	Monoterp. ether
Isomenthone	8.19	1170	4.72	5.07	1414	6.07	Monoterp. ketone
neo-Menthol	8.47	1181	3.66	4.30	1531	8.48*	Monoterp. alcohol
Borneol	8.52	1183	0.21	0.32	1630	11.65*	Monoterp. alcohol
<i>trans</i> -Isopulegone	8.55	1184	0.11	0.44	1510	7.89*	Monoterp. ketone
Terpinen-4-ol	8.68	1189	0.75	[4.30]	1531	8.48*	Monoterp. alcohol
Menthol	8.96	1199	32.74	32.79	1577	9.86	Monoterp. alcohol
Isomenthol	9.07	1203	0.57	0.55	1553	9.17	Monoterp. alcohol
neoiso-Menthol	9.25	1207	0.22	0.17	1619	11.18	Monoterp. alcohol
α -Terpineol	9.38	1210	0.40	1.75	1623	11.37*	Monoterp. alcohol
β -Phellandren-8-ol	9.45	1211	0.03	0.02	1705	15.00	Monoterp. alcohol
Pulegone	10.80	1242	1.57	1.55	1547	8.98	Monoterp. ketone

Carvone	11.19	1251	0.29	[1.75]	1623	11.37*	Monoterp. ketone
Piperitone	11.58	1259	0.61	[1.75]	1623	11.37*	Monoterp. ketone
neo-Menthyl acetate	12.18	1273	0.41	0.40	1462	6.99	Monoterp. ester
Menthyl acetate	13.19	1296	6.08	[6.19]	1500	7.71*	Monoterp. ester
Isomenthyl acetate	13.78	1307	0.23	[0.44]	1510	7.89*	Monoterp. ester
Menthofuro lactone	16.67	1352	0.03				Monoterp. lactone
α-Copaene	17.32	1362	0.04	0.05	1443	6.61	Sesquiterpene
β-Bourbonene	17.74	1369	0.17	0.16	1455	6.85	Sesquiterpene
β-Elemene	18.55	1381	0.08	2.63	1527	8.36*	Sesquiterpene
β-Caryophyllene	20.21	1406	2.43	[2.63]	1527	8.36*	Sesquiterpene
β-Copaene	21.07	1416	0.04	0.03	1521	8.15	Sesquiterpene
α-Humulene	22.92	1439	0.12	0.13	1579	9.92	Sesquiterpene
trans-β-Farnesene	24.11	1453	0.18	[0.32]	1630	11.65*	Sesquiterpene
γ-Murolene	25.12*	1465	0.76	0.10	1611	10.90	Sesquiterpene
Germacrene D	25.12*	1465	[0.76]	[1.75]	1623	11.37*	Sesquiterpene
Bicyclogermacrene	26.34*	1480	0.17	0.09	1642	12.21	Sesquiterpene
α-Selinene	26.34*	1480	[0.17]	0.03	1637	11.99	Sesquiterpene
δ-Cadinene	28.80	1511	0.08	0.06	1673	13.62	Sesquiterpene
Caryophyllene oxide	33.41	1574	0.02				Sesquiterp. alcohol
Viridiflorol	34.50	1588	0.04	0.04	1976	32.07	Sesquiterp. alcohol
Total identified			98.99%	98.70%			

*: 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 : 1.4595 ± 0.0003 (20 °C)

CONCLUSION

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

