

Date : November 28, 2016

SAMPLE IDENTIFICATION

Internal code : 16K23-GUR3-1-DM

Customer identification : Peppermint 5.5% - Lot #P01101/16

Type : Essential oil

Source : *Mentha x piperita*

Customer : HealthLand LLC.

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 : 2016-11-23

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.	
Isoamyl alcohol	1.14	728	0.02	5.59	1141	2.29*	Aliphatic alcohol
2-Methylbutyl alcohol	1.17	731	0.02	[5.59]	1141	2.29*	Aliphatic alcohol
2,5-Diethyltetrahydrofuran	2.85	893	0.03	0.04	962	0.93	Furan
α -Thujene	3.25	918	0.05	0.13	945	0.86	Monoterpene
α -Pinene	3.36	925	0.91	0.84	940	0.84	Monoterpene
Camphene	3.64	942	0.03	0.03	989	1.04	Monoterpene
3-Methylcyclohexanone	3.96	961	0.02	0.03	1246	3.58	Aliphatic ketone
Sabinene	4.08	968	0.53	0.57	1050	1.45	Monoterpene
β -Pinene	4.14	972	1.31	1.30	1034	1.32	Monoterpene
Myrcene	4.42	989	0.29	0.27	1109	1.92	Monoterpene
Octen-3-ol	4.52	995	0.06	4.89	1412	5.93*	Aliphatic alcohol
α -Phellandrene	4.69	1004	0.03	0.04	1101	1.86	Monoterpene
Octan-3-ol	4.79	1010	0.17	0.18	1340	4.89	Aliphatic alcohol
α -Terpinene	4.88	1015	0.25	0.26	1117	2.00	Monoterpene
Limonene	5.12*	1028	2.77	2.71	1137	2.23	Monoterpene
para-Cymene	5.12*	1028	[2.77]	0.15	1199	2.96	Monoterpene
1,8-Cineole	5.19	1032	5.43	[5.59]	1141	2.29*	Monoterp. ether
<i>cis</i> - β -Ocimene	5.29	1038	0.23	0.64	1180	2.74*	Monoterpene
<i>trans</i> - β -Ocimene	5.47	1048	0.06	0.05	1194	2.90	Monoterpene
γ -Terpinene	5.65	1058	0.44	[0.64]	1180	2.74*	Monoterpene
<i>cis</i> -Linalool oxide (fur.)	5.95	1073	0.01	0.01	1368	5.30*	Monoterp. alcohol
<i>cis</i> -Sabinene hydrate	6.01	1077	0.36	5.62	1405	5.84*	Monoterp. alcohol
Terpinolene	6.12	1083	0.14	0.14	1217	3.17	Monoterpene
para-Cymenene	6.34	1095	0.01	[0.01]	1368	5.30*	Monoterpene
<i>trans</i> -Sabinene hydrate	6.65	1107	0.08	0.11	1470	7.01	Monoterp. alcohol
Linalool	6.71	1109	0.21	0.31	1483	7.23*	Monoterp. alcohol
Camphor	7.75	1148	0.03	0.04	1427	6.18	Monoterp. ketone
Isopulegol	7.85	1152	0.06	[0.31]	1483	7.23*	Monoterp. alcohol
Menthone	8.13	1162	29.17	28.90	1394	5.67	Monoterp. ketone
Menthofuran	8.20	1165	4.57	[5.62]	1405	5.84*	Monoterp. ether
Isomenthone	8.29	1168	4.58	[4.89]	1412	5.93*	Monoterp. ketone
neo-Menthol	8.54	1178	2.95	5.32	1527	8.12*	Monoterp. alcohol
<i>trans</i> -Isopulegone	8.59	1179	0.20	0.27	1504	7.62	Monoterp. ketone
Borneol	8.63	1181	0.16	1.12	1618	10.83*	Monoterp. alcohol
Terpinen-4-ol	8.75	1185	0.75	0.94	1524	8.02*	Monoterp. alcohol
Menthol	9.11*	1198	28.14	28.30	1573	9.51	Monoterp. alcohol
Isomenthol	9.11*	1198	[28.14]	0.51	1548	8.75	Monoterp. alcohol
neoiso-Menthol	9.35	1203	0.18	1.36	1624	11.02*	Monoterp. alcohol
α -Terpineol	9.49	1206	0.41	[1.12]	1618	10.83*	Monoterp. alcohol
Pulegone	10.92	1239	2.20	2.11	1545	8.64	Monoterp. ketone
Carvone	11.28	1247	0.06	[1.12]	1618	10.83*	Monoterp. ketone

Piperitone	11.68	1256	0.47	[1.12]	1618	10.83*	Monoterp. ketone
neo-Menthyl acetate	12.24	1267	0.30	0.31	1458	6.76	Monoterp. ester
Dihydroedulan I	13.03	1285	0.02	0.03	1442	6.48	Edulan
Menthyl acetate	13.28	1291	4.56	4.40	1495	7.46	Monoterp. ester
Isomenthyl acetate	13.85	1301	0.16	[0.94]	1524	8.02*	Monoterp. ester
Bicycloelemene	14.80	1316	0.03	[4.89]	1412	5.93*	Sesquiterpene
α-Terpinyl acetate	16.75	1345	0.03	0.04	1607	10.53	Monoterp. ester
Menthofurolactone	16.97	1349	0.02				Monoterp. lactone
α-Copaene	17.41	1355	0.04	0.04	1434	6.32	Sesquiterpene
β-Bourbonene	17.84	1362	0.18	0.12	1454	6.69	Sesquiterpene
β-Elemene	18.65	1375	0.06	[0.94]	1524	8.02*	Sesquiterpene
β-Caryophyllene	20.37	1400	2.73	[5.32]	1527	8.12*	Sesquiterpene
β-Copaene	21.18	1410	0.04	0.03	1513	7.80	Sesquiterpene
cis-β-Farnesene	22.40	1424	0.04	0.03	1597	10.20	Sesquiterpene
α-Humulene	23.04	1432	0.12	0.19	1589	9.97	Sesquiterpene
trans-β-Farnesene	24.22	1446	0.35	[1.12]	1618	10.83*	Sesquiterpene
Germacrene D	25.31*	1459	1.49	[1.36]	1624	11.02*	Sesquiterpene
γ-Murolene	25.31*	1459	[1.49]	0.06	1601	10.34	Sesquiterpene
Bicyclgermacrene	26.48*	1473	0.19	0.10	1642	11.76	Sesquiterpene
α-Selinene	26.48*	1473	[0.19]	[1.36]	1624	11.02*	Sesquiterpene
γ-Cadinene	28.28	1494	0.02	0.01	1663	12.69	Sesquiterpene
Mint lactone	28.51	1498	0.03	0.03	2118	37.49	Monoterp. lactone
δ-Cadinene	28.93	1503	0.08	0.05	1672	13.10	Sesquiterpene
Caryophyllene oxide	33.52	1566	0.06	0.04	1846	22.42	Sesquiterp. ether
Spathulenol	33.74	1569	0.02	0.01	2019	33.55	Sesquiterp. alcohol
Viridiflorol	34.62	1581	0.18	0.15	1975	30.97	Sesquiterp. alcohol
Total identified			98.14%	98.42%			

*: 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 : 1.4600 ± 0.0003 (20 °C)

CONCLUSION

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

