

GC/MS BATCH NUMBER: MC0100

ESSENTIAL OIL: MELISSA ORGANIC
BOTANICAL NAME: MELISSA OFFICINALIS
ORIGIN: FRANCE

KEY CONSTITUENTS PRESENT IN THIS BATCH OF MELISSA ORGANIC OIL	%
GERANIAL	23.0
β -CARYOPHYLLENE	22.3
NERAL	16.5
GERMACRENE D	10.0
CITRONELLAL	2.2
trans- β -OCIMENE	2.2
Δ -CADINENE	2.0
α -HUMULENE	1.5
CARYOPHYLLENE OXIDE	1.5
GERANYL ACETATE	1.5
6-METHYL-5-HEPTEN-2-ONE	1.4
(E)-ISOCITRAL	1.2
LINALOOL	1.0

Comments from Robert Tisserand: Both olfactory assessment and lab analysis show a genuine Melissa oil.

Date : October 28, 2015

SAMPLE IDENTIFICATION

Internal code : 15J20-PTH1-1-LC

Customer identification : Melissa - France - MC010051R

Type : Essential oil

Source : *Melissa officinalis*

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.

Analysis date : 2015-10-21

IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Acetone	0.30	484	0.03	0.04	717	0.41	Aliphatic ketone
Hexan-2-ol	1.43	815	0.00				Aliphatic alcohol
<i>trans</i> -2-Hexenal	1.87	853	0.01	0.02	984	1.06*	Aliphatic aldehyde
<i>cis</i> -Hex-3-en-1-ol	1.97	862	0.02	0.01	1347	5.43	Aliphatic alcohol
α -Pinene	2.78	924	0.02	[0.02]	984	1.06*	Monoterpene
β -Pinene	3.50	970	0.02	0.02	1063	1.69	Monoterpene
Myrcene	3.80	989	0.16	0.13	1134	2.44	Monoterpene
Octen-3-ol	3.85	992	0.56	0.56	1417	6.58	Aliphatic alcohol
6-Methyl-5-hepten-2-one	3.87	994	1.35	1.26	1300	4.71	Aliphatic ketone
Octan-3-ol	4.11	1008	0.03	0.04	1367	5.73	Aliphatic alcohol
<i>cis</i> -Hex-3-en-1-yl acetate	4.19	1013	0.05	0.04	1283	4.47	Aliphatic ester
Limonene	4.43*	1026	0.19	0.16	1157	2.73	Monoterpene
<i>para</i> -Cymene	4.43*	1026	[0.19]	0.03	1228	3.67	Monoterpene
β -Phellandrene	4.49	1029	0.03	0.03	1162	2.79	Monoterpene
<i>cis</i> - β -Ocimene	4.64	1038	0.23	0.27	1206	3.35*	Monoterpene
<i>trans</i> - β -Ocimene	4.82	1048	2.21	2.22	1221	3.57	Monoterpene
γ -Terpinene	4.97	1057	0.03	[0.27]	1206	3.35*	Monoterpene
Bergamal	5.00	1059	0.02	0.01	1313	4.91	Aliphatic aldehyde
<i>cis</i> -Linalool oxide (fur.)	5.17	1068	0.01	0.01	1400	6.22	Monoterp. alcohol
Terpinolene	5.45	1084	0.01	0.02	1241	3.86	Monoterpene
Rose furan	5.66	1096	0.05	0.03	1366	5.71	Monoterp. ether
Unknown (m/z = 81, 41 (96), 69 (74), 123 (57), 109 (56), 83 (53)... 137 (28)... 152 (4))	5.85	1106	0.07				
Linalool	5.89	1108	0.91	1.00	1515	8.80	Monoterp. alcohol
Nonanal	5.95*	1110	0.18	0.07	1356	5.56	Monoterp. aldehyde
<i>cis</i> -Rose oxide	5.95*	1110	[0.18]	0.06	1312	4.89	Monoterp. ether
<i>trans</i> -Rose oxide	6.20	1122	0.01	0.03	1324	5.07	Monoterp. ether
<i>cis</i> - <i>para</i> -Mentha-2,8-dien- 1-ol	6.49	1135	0.24				Monoterp. ether
<i>exo</i> -Isocitral	6.68	1144	0.16	0.81	1441	7.07*	Monoterp. aldehyde
Camphor	6.73	1146	0.45	0.39	1447	7.21	Monoterp. ketone
Isopulegol	6.79	1149	0.03	0.04	1513	8.72	Monoterp. ketone
Citronellal	6.89*	1153	2.47	2.21	1434	6.94	Monoterp. aldehyde
<i>trans</i> -Chrysanthemal	6.89*	1153	[2.47]	0.27	1422	6.68	Monoterp. aldehyde
(<i>Z</i>)-Isocitral	7.11	1163	0.71	0.51	1503	8.38	Monoterp. aldehyde
(<i>E</i>)-Isocitral	7.59	1185	1.19	1.20	1524	9.09	Monoterp. aldehyde
α -Terpineol	8.06	1204	0.09	0.09	1643	13.60	Monoterp. alcohol
Nerol	9.00	1229	0.46	0.56	1748	19.29	Monoterp. alcohol
Citronellol	9.26	1237	0.42	0.44	1725	17.89	Monoterp. alcohol

Neral	9.56	1244	16.53	16.86	1621	12.58	Monoterp. aldehyde
Methyl citronellate	10.06	1258	0.37	0.25	1538	9.53	Monoterp. ester
Geraniol	10.11	1259	0.66	0.77	1802	22.69	Monoterp. alcohol
Geranial	10.88	1280	23.03	23.06	1673	15.02	Monoterp. aldehyde
Methyl geranate	12.95	1323	0.35	0.33	1641	13.50	Monoterp. ester
Unknown (m/z = 59, 79 (97), 94 (88), 43 (46)...)	13.30	1329	0.01				
Citronellyl acetate	14.50	1351	0.09	0.08	1625	12.75	Monoterp. ester
α -Copaene	14.71	1354	0.82	[0.81]	1441	7.07*	Sesquiterpene
Neryl acetate	15.06*	1360	0.46	0.34	1680	15.38*	Monoterp. ester
Eugenol	15.06*	1360	[0.46]	0.33	2086	38.55*	Phenylpropanoid
β -Cubebene	15.57	1369	0.30	0.33	1491	8.10	Sesquiterpene
β -Elemene	15.81	1374	0.19	22.34	1537	9.50*	Sesquiterpene
Geranyl acetate	16.42	1384	1.57	1.47	1711	17.02	Monoterp. ester
β -Caryophyllene	17.43*	1401	22.74	[22.34]	1537	9.50*	Sesquiterpene
Geranic acid	17.43*	1401	[22.74]	0.33	2278	43.69	Monoterp. acid
<i>cis</i> - β -Farnesene	19.24	1425	0.08	1.52	1600	11.56*	Sesquiterpene
α -Humulene	19.64	1431	1.50	[1.52]	1600	11.56*	Sesquiterpene
<i>trans</i> - β -Farnesene	20.88	1447	0.33	10.08	1636	13.26*	Sesquiterpene
Germacrene D	21.81	1459	10.13	[10.08]	1636	13.26*	Sesquiterpene
Valencene	23.53*	1482	0.74	0.42	1677	15.23	Sesquiterpene
α -Muurolene	23.53*	1482	[0.74]	0.34	1659	14.37	Sesquiterpene
(<i>Z,E</i>)- α -Farnesene	24.04	1488	0.64	2.12	1688	15.74*	Sesquiterpene
γ -Cadinene	24.43	1494	0.28	[0.34]	1680	15.38*	Sesquiterpene
δ -Cadinene	25.09*	1502	1.95	[2.12]	1688	15.74*	Sesquiterpene
(<i>E,E</i>)- α -Farnesene	25.09*	1502	[1.95]	0.42	1708	16.80	Sesquiterpene
Caryophyllene oxide	29.73	1557	1.46	1.24	1859	26.77	Sesquiterp. ether
Germacrene D-4-ol	29.97	1560	0.44	0.49	1970	33.83	Sesquiterp. alcohol
τ -Cadinol	34.96	1634	0.20	[0.33]	2086	38.55*	Sesquiterp. alcohol
τ -Muurolol	35.10	1637	0.32	0.31	2099	39.02	Sesquiterp. alcohol
α -Muurolol	35.24	1640	0.07	0.10	2117	39.51	Sesquiterp. alcohol
α -Cadinol	35.63	1648	0.67	0.75	2143	40.24	Sesquiterp. alcohol
Total identified			98.27%	96.86%			

*: 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 : 1.4910 ± 0.0003 (20 °C)

CONCLUSION

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

Checked and approved by :

Alexis St-Gelais, M. Sc., chimiste 2013-174

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