

GC/MS BATCH NUMBER: MC0101

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

KEY CONSTITUENTS PRESENT IN THIS BATCH OF MELISSA ORGANIC OIL	%
GERANIAL	32.8
NERAL	22.1
CITRONELLAL	9.0
β -CARYOPHYLLENE	8.5
6-METHYL-5-HEPTEN-2-ONE	3.6
GERANIOL	3.3
GERANYL ACETATE	3.0
CARYOPHYLLENE OXIDE	2.4
NEROL	2.0
LINALOOL	1.6
METHYL GERANATE	1.3
α -HUMULENE	1.2

Comments from Robert Tisserand: Both the odor profile and the analysis show a genuine, complex Melissa oil.

Date : June 27, 2016

SAMPLE IDENTIFICATION

Internal code : 16F21-PTH2-1-DM

Customer identification : Melissa Organic - Bulgaria - MC010158R

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., chimiste

Analysis date : 2016-06-23

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.	
<i>cis</i> -Hex-3-en-1-ol	2.52	871	0.03	0.04	1347	5.07	Aliphatic alcohol
<i>trans</i> -Hex-2-en-1-ol	2.71	886	0.01	0.02	1364	5.33	Aliphatic alcohol
Hexanol	2.74	889	0.01	0.01	1305	4.46	Aliphatic alcohol
Tricyclene	3.09	913	tr	tr	921	0.79	Monoterpene
α -Pinene	3.35	929	0.01	tr	949	0.90	Monoterpene
Sabinene	4.07	973	0.98	0.98	1061	1.58	Monoterpene
β -Pinene	4.13	976	0.28	0.27	1044	1.44	Monoterpene
Myrcene	4.41	993	0.06	0.05	1119	2.08	Monoterpene
Octen-3-ol	4.46	996	0.10	0.20	1411	6.02	Aliphatic alcohol
6-Methyl-5-hepten-2-one	4.50	999	3.58	3.44	1281	4.14	Aliphatic ketone
Limonene	5.09	1031	0.31	0.32	1143	2.37	Monoterpene
<i>cis</i> - β -Ocimene	5.28	1042	0.01	0.02	1191	2.93	Monoterpene
<i>trans</i> - β -Ocimene	5.45	1052	0.14	0.13	1208	3.12	Monoterpene
Bergamal	5.67	1064	0.04	0.03	1301	4.40	Aliphatic aldehyde
<i>cis</i> -Linalool oxide (fur.)	5.94	1079	0.01	0.01	1383	5.61	Monoterp. alcohol
para-Cymenene	6.26	1097	0.03	0.03	1370	5.41	Monoterpene
Rose furan	6.34	1101	0.03	0.02	1350	5.11	Monoterp. ether
Perillene	6.45	1105	0.02	0.02	1343	5.02	Monoterp. ether
Linalool	6.66	1113	1.56	1.69	1500	7.69*	Monoterp. alcohol
<i>cis</i> -Rose oxide	6.69*	1115	0.14	0.03	1298	4.36	Monoterp. ether
Nonanal	6.69*	1115	[0.14]	0.06	1353	5.16	Aliphatic aldehyde
<i>trans</i> -Rose oxide	7.04	1128	0.05	0.04	1328	4.80	Monoterp. ether
<i>trans</i> -Pinocarveol	7.41	1141	0.19	0.20	1565	9.50	Monoterp. alcohol
exo-Isocitral	7.63	1150	0.05	0.05	1440	6.56	Monoterp. aldehyde
Isopulegol	7.71	1153	0.43	[1.69]	1500	7.69*	Monoterp. alcohol
Citronellal	7.92*	1160	9.78	8.95	1424	6.26	Monoterp. aldehyde
<i>trans</i> -Chrysanthemal	7.92*	1160	[9.78]	0.28	1434	6.44	Monoterp. aldehyde
(<i>Z</i>)-Isocitral	8.15	1169	0.27	0.20	1481	7.33	Monoterp. aldehyde
Borneol	8.57	1185	0.60	0.65	1623	11.37	Monoterp. alcohol
(<i>E</i>)-Isocitral	8.75*	1192	0.57	0.36	1510	7.89	Monoterp. aldehyde
Terpinen-4-ol	8.75*	1192	[0.57]	0.14	1545	8.91	Monoterp. alcohol
α -Terpineol	9.34	1209	0.03	0.06	1642	12.22	Monoterp. alcohol
Nerol	10.70	1240	2.03	2.00	1733	16.53	Monoterp. alcohol
Neral	11.18*	1251	22.59	22.08	1611	10.89	Monoterp. aldehyde
Citronellol	11.18*	1251	[22.59]	0.84	1713	15.38	Monoterp. alcohol
Cuminal	11.31	1253	0.09	0.08	1679	13.88	Monoterp. aldehyde
Geraniol	12.12*	1272	3.33	3.28	1784	19.57	Monoterp. alcohol
Methyl citronellate	12.12*	1272	[3.33]	0.42	1514	7.98	Monoterp. ester
Geranial	12.79	1287	32.81	32.98	1659	12.98	Monoterp. aldehyde
Methyl geranate	15.24	1330	1.26	1.46	1630	11.66*	Monoterp. ester
α -Terpinyl acetate	16.62	1351	0.11	[1.46]	1630	11.66*	Monoterp. ester

Neryl acetate	17.65	1367	0.18	0.22	1664	13.19	Monoterp. ester
β-Cubebene	17.88	1371	0.11	0.08	1486	7.44	Sesquiterpene
Citronellic acid	18.25	1376	0.26	0.31	2177	39.97	Monoterp. acid
Geranyl acetate	19.20	1391	2.96	2.63	1696	14.65	Monoterp. ester
β-Caryophyllene	20.32	1407	8.54	8.59	1532	8.50	Sesquiterpene
Geranic acid	20.81	1413	0.45	0.62	2255	41.97	Monoterp. acid
cis-β-Farnesene	22.66	1435	0.10	0.09	1579	9.93	Sesquiterpene
α-Humulene	22.96	1439	1.18	1.16	1594	10.38	Sesquiterpene
γ-Murolene	25.11	1465	0.10	0.10	1612	10.93	Sesquiterpene
γ-Cadinene	28.13	1502	0.03	0.03	1669	13.42	Sesquiterpene
δ-Cadinene	28.81	1511	0.04	0.02	1675	13.68	Sesquiterpene
Caryophyllene oxide	33.47*	1575	2.73	2.44	1852	23.85	Sesquiterp. ether
Geranyl butyrate	33.47*	1575	[2.73]	0.28	1847	23.51	Sesquiterp. ether
Humulene epoxide II	35.15	1597	0.12	0.11	1902	27.39	Sesquiterp. ether
α-Cadinol	37.84	1658	0.02	0.03	2126	38.57	Sesquiterp. alcohol
Total identified			98.36%	98.15%			

*: 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 : Yellow-brown liquid

Refractive index : 1.4820 ± 0.0003 (20 °C)

CONCLUSION

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



