

GC/MS BATCH NUMBER: M10101

ESSENTIAL OIL: MANDARIN
BOTANICAL NAME: CITRUS RETICULATA
ORIGIN: BRAZIL

KEY CONSTITUENTS PRESENT IN THIS BATCH OF MANDARIN OIL	%
LIMONENE	66.2
γ-TERPINENE	21.2
α-PINENE	2.2
MYRCENE	1.7
β-PINENE	1.7
DIMETHYL ANTHRANILATE	0.7
p-CYMENE	0.6
α-SINENSAL	0.5
LINALOOL	0.2
OCTANAL	0.1
DECANAL	0.1

Comments from Robert Tisserand: A beautiful, rich Mandarin oil. Of 11 key ISO constituents, two are slightly out of range, but these are not a concern.

Date : November 12, 2015

SAMPLE IDENTIFICATION

Internal code : 15K05-PTH7-1-LC

Customer identification : Mandarin Green - Brazil - M1010145

Type : Essential oil

Source : *Citrus reticulata*

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 : 2015-11-06

IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
α -Thujene	2.70	919	0.82	0.88	998	1.12	Monoterpene
α -Pinene	2.79	925	2.21	2.11	987	1.08	Monoterpene
Camphene	3.05	941	0.01	0.01	1025	1.36	Monoterpene
Sabinene	3.46	968	0.24	0.26	1084	1.88	Monoterpene
β -Pinene	3.51	971	1.70	1.69	1065	1.71	Monoterpene
Myrcene	3.81	990	1.74	1.63	1135	2.46	Monoterpene
α -Phellandrene	4.05	1004	0.07	0.07	1127	2.36	Monoterpene
Octanal	4.18	1012	0.11	0.14	1253	4.04	Aliphatic aldehyde
α -Terpinene	4.23	1015	0.45	0.49	1141	2.53	Monoterpene
<i>cis</i> - β -Ocimene	4.57*	1034	67.30	21.40	1214	3.47*	Monoterpene
para-Cymene	4.57*	1034	[67.30]	0.58	1230	3.70	Monoterpene
1,8-Cineole	4.57*	1034	[67.30]	0.25	1171	2.91	Monoterp. ether
Limonene	4.57*	1034	[67.30]	66.23	1170	2.89	Monoterpene
<i>trans</i> - β -Ocimene	4.83	1049	0.02	0.04	1223	3.60	Monoterpene
γ -Terpinene	5.06	1062	21.23	[21.40]	1214	3.47*	Monoterpene
<i>cis</i> -Sabinene hydrate	5.32	1077	0.04	0.05	1422	6.68	Monoterp. alcohol
Terpinolene	5.44	1084	0.98	0.99	1243	3.89	Monoterpene
<i>trans</i> -Sabinene hydrate	5.88	1107	0.06	0.09	1503	8.39	Monoterp. alcohol
Linalool	5.90	1108	0.18	0.18	1515	8.78	Monoterp. alcohol
Nonanal	5.96	1111	0.03	0.03	1357	5.57	Monoterp. aldehyde
<i>trans</i> -Limonene oxide	6.37	1130	0.01	0.01	1404	6.31	Monoterp. ether
Citronellal	6.88	1153	0.02	0.02	1434	6.92	Monoterp. aldehyde
Terpinen-4-ol	7.50	1181	0.07	0.06	1544	9.74	Monoterp. alcohol
α -Terpineol	8.04	1204	0.27	0.27	1640	13.46	Monoterp. alcohol
Decanal	8.32*	1211	0.11	0.08	1455	7.36	Aliphatic aldehyde
γ -Terpineol	8.32*	1211	[0.11]	0.06	1644	13.64	Monoterp. alcohol
β -Caryophyllene	17.18	1397	0.17	0.17	1532	9.33	Sesquiterpene
Dimethyl anthranilate	17.88	1407	0.72	0.75	1961	33.29	Phenolic ester
(<i>E,E</i>)- α -Farnesene	25.05*	1502	0.48	0.44	1708	16.83	Sesquiterpene
δ -Cadinene	25.05*	1502	[0.48]	0.04	1690	15.86	Sesquiterpene
α -Sinensal	39.86	1751	0.46	0.45	2246	42.91	Sesquiterp. aldehyde
Total identified			99.5%	99.47%			

*: 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 : Dark yellow-green liquid

Refractive index : 1.4750 ± 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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