

GC/MS BATCH NUMBER: L10101

ESSENTIAL OIL: LEMON
BOTANICAL NAME: CITRUS X LIMON
ORIGIN: USA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF STEAM DISTILLED LEMON OIL	%
LIMONENE	72.8
β-PINENE	9.4
γ-TERPINENE	7.6
α-PINENE	1.7
MYRCENE	1.6
p-CYMENE	1.1
GERANIAL	0.7
NERAL	0.5
NERYL ACETATE	0.5
β-BISABOLENE	0.4
α-TERPINEOL	0.4
GERANYL ACETATE	0.3

Comments from Robert Tisserand: A remarkably true odor for a distilled lemon oil. Most of the minor constituents are in similar amounts to those found in expressed lemon oils.

Date : April 20, 2016

SAMPLE IDENTIFICATION

Internal code : 16D07-PTH9-1-LC

Customer identification : Lemon Distilled - USA - L1010154

Type : Essential oil

Source : *Citrus x limon*

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 : 2016-04-19

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.	
Tricyclene	2.99	915	0.01	0.01	932	0.83	Monoterpene
α -Thujene	3.08	921	0.34	0.43	960	0.95	Monoterpene
α -Pinene	3.18	927	1.73	1.64	952	0.91	Monoterpene
Camphene	3.46	944	0.07	0.06	1006	1.14	Monoterpene
Sabinene	3.89	970	0.54	0.54	1062	1.59	Monoterpene
β -Pinene	3.96	975	9.35	9.41	1047	1.47	Monoterpene
Myrcene	4.23	991	1.62	1.53	1120	2.09	Monoterpene
α -Phellandrene	4.48	1006	0.05	0.03	1112	2.02	Monoterpene
Octanal	4.60	1013	0.04	0.03	1238	3.54	Aliphatic aldehyde
α -Terpinene	4.67	1017	0.25	0.21	1126	2.17	Monoterpene
Limonene	5.01*	1035	73.54	72.75	1156	2.52	Monoterpene
para-Cymene	5.01*	1035	[73.54]	1.07	1215	3.22	Monoterpene
1,8-Cineole	5.01*	1035	[73.54]	0.28	1157	2.53	Monoterp. ether
<i>cis</i> - β -Ocimene	5.09	1040	0.03	7.64	1198	3.01*	Monoterpene
<i>trans</i> - β -Ocimene	5.26	1050	0.07	0.06	1210	3.14	Monoterpene
γ -Terpinene	5.47	1061	7.59	[7.64]	1198	3.01*	Monoterpene
Terpinolene	5.90	1086	0.43	0.43	1229	3.42	Monoterpene
Linalool	6.31	1107	0.14	0.15	1504	7.77	Monoterp. alcohol
Nonanal	6.43	1112	0.05	0.04	1344	5.03	Aliphatic aldehyde
<i>cis</i> -Limonene oxide	6.94	1131	0.03	0.03	1379	5.55	Monoterp. ether
<i>trans</i> -Limonene oxide	7.04	1136	0.02	0.02	1393	5.74	Monoterp. ether
Terpinen-4-ol	8.20	1181	0.58	0.61	1536	8.62	Monoterp. alcohol
α -Terpineol	8.76	1203	0.42	0.41	1632	11.78	Monoterp. alcohol
Neral	10.38	1241	0.48	0.42	1607	10.78	Monoterp. aldehyde
Geranial	11.77	1274	0.73	0.61	1655	12.78	Monoterp. aldehyde
Neryl acetate	16.73	1363	0.47	0.89	1665	13.22*	Monoterp. ester
Geranyl acetate	18.14	1386	0.28	0.24	1696	14.65	Monoterp. ester
β -Caryophyllene	19.25	1403	0.12	0.13	1526	8.32	Sesquiterpene
<i>trans</i> - α -Bergamotene	20.81	1422	0.28	0.20	1533	8.53	Sesquiterpene
β -Bisabolene	27.22	1501	0.42	[0.89]	1665	13.22*	Sesquiterpene
Total identified			99.68%	99.87%			

*: 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 : 1.4730 \pm 0.0003 (20 °C)

CONCLUSION

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



