



GC/MS BATCH NUMBER: L70102

ESSENTIAL OIL: LEMON ORGANIC
BOTANICAL NAME: CITRUS X LIMON
ORIGIN: ITALY

KEY CONSTITUENTS PRESENT IN THIS BATCH OF LEMON ORGANIC OIL	%
LIMONENE	68.8
β -PINENE	10.6
γ -TERPINENE	9.2
α -PINENE	1.7
SABINENE	1.6
GERANIAL	1.5
MYRCENE	1.5

Comments from Robert Tisserand: Good fresh odor profile, and conforms to 12 of 13 ISO constituents for US coast type. Beta-Bisabolene is slightly low – not a concern.

Date : July 20, 2016

SAMPLE IDENTIFICATION

Internal code : 16G04-PTH4-1-DM

Customer identification : Organic Lemon - L7010259

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 : 2016-07-20

Checked and approved by :

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

Note: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.

This report is digitally signed, it is only considered valid if the digital signature is intact.

IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
α -Thujene	3.26	923	0.35	0.49	958	0.94	Monoterpene
α -Pinene	3.36	930	1.74	1.52	950	0.90	Monoterpene
Camphene	3.64	947	0.05	0.05	1004	1.13	Monoterpene
Sabinene	4.08	973	1.59	2.13	1061	1.58	Monoterpene
β -Pinene	4.16	978	10.58	10.54	1045	1.45	Monoterpene
Myrcene	4.42	994	1.47	1.44	1119	2.08	Monoterpene
α -Phellandrene	4.68*	1009	0.04	0.03	1111	2.01	Monoterpene
Δ^3 -Carene	4.68*	1009	[0.04]	0.01	1092	1.82	Monoterpene
Octanal	4.81	1016	0.06	0.06	1236	3.51	Aliphatic aldehyde
α -Terpinene	4.87	1020	0.16	0.26	1125	2.16	Monoterpene
Limonene	5.20*	1038	70.11	68.79	1154	2.50	Monoterpene
para-Cymene	5.20*	1038	[70.11]	0.43	1213	3.19	Monoterpene
1,8-Cineole	5.20*	1038	[70.11]	0.30	1155	2.51	Monoterp. ether
cis- β -Ocimene	5.29	1043	0.05	9.34	1196	2.99*	Monoterpene
trans- β -Ocimene	5.47	1053	0.11	0.18	1208	3.12	Monoterpene
γ -Terpinene	5.68	1064	9.24	[9.34]	1196	2.99*	Monoterpene
cis-Sabinene hydrate	6.00	1082	0.03	0.03	1411	6.01	Monoterp. alcohol
Terpinolene	6.11	1088	0.34	0.33	1227	3.39	Monoterpene
Linalool	6.64	1113	0.10	0.08	1497	7.63	Monoterp. alcohol
Nonanal	6.69	1115	0.07	0.06	1342	4.99	Aliphatic aldehyde
cis-Limonene oxide	7.23	1135	0.02	0.02	1376	5.50	Monoterp. ether
trans-Limonene oxide	7.35	1139	0.01	0.01	1389	5.68	Monoterp. ether
Citronellal	7.86	1158	0.05	0.04	1419	6.17	Monoterp. aldehyde
Terpinen-4-ol	8.66	1188	0.02	0.08	1532	8.50*	Monoterp. alcohol
α -Terpineol	9.33	1209	0.07	0.07	1627	11.51	Monoterp. alcohol
Decanal	9.64	1216	0.02	0.01	1442	6.58	Aliphatic aldehyde
Nerol	10.54	1236	0.02	0.02	1730	16.34	Monoterp. alcohol
Neral	10.98	1246	0.97	0.99	1601	10.62	Monoterp. aldehyde
Geraniol	11.86	1266	0.01	0.02	1781	19.36	Monoterp. alcohol
Geranial	12.49	1280	1.52	1.57	1650	12.59	Monoterp. aldehyde
Citronellyl acetate	16.99	1357	0.02	0.03	1607	10.79	Monoterp. ester
Neryl acetate	17.63	1367	0.31	0.44	1661	13.05*	Monoterp. ester
Geranyl acetate	19.11	1390	0.41	0.41	1692	14.46	Monoterp. ester
β -Caryophyllene	20.17	1405	0.05	0.04	1526	8.32	Sesquiterpene
trans- α -Bergamotene	21.76	1424	0.08	[0.08]	1532	8.50*	Sesquiterpene
β -Bisabolene	28.38	1505	0.12	[0.44]	1661	13.05*	Sesquiterpene
Citropten	47.91	1996	0.01				Coumarin
Total identified			99.80%	99.82%			

*: 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 liquid

Refractive index : 1.4715 ± 0.0003 (20 °C)

CONCLUSION

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



