



**PLANT THERAPY**  
100% PURE ESSENTIAL OILS

GC/MS BATCH NUMBER: L60107

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**ESSENTIAL OIL:** LEMON

**BOTANICAL NAME:** CITRUS X LIMON

**ORIGIN:** USA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF LEMON OIL	%
LIMONENE	67.4
β-PINENE	12.2
γ-TERPINENE	7.8
α-PINENE	1.9
SABINENE	1.8
MYRCENE	1.5
GERANIAL	1.3

Comments from Robert Tisserand: Delightful fresh, clean odor profile. Meets 12 of 13 ISO standards for Coastal type Lemon oil, with gamma-terpinene slightly low - not a concern.

**Date :** March 10, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17B21-PTH2-1-DM

**Customer identification :** Lemon - California - L6010767R

**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 :** 2017-03-08

Checked and approved by :

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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	3.21	917	tr	0.01	927	1.09	Monoterpene
$\alpha$ -Thujene	3.29	921	0.35	0.39	963	1.25	Monoterpene
$\alpha$ -Pinene	3.40	928	1.85	1.81	953	1.20	Monoterpene
Camphene	3.68	945	0.06	0.06	1002	1.50	Monoterpene
Sabinene	4.12	970	1.82	1.80	1063	2.05	Monoterpene
$\beta$ -Pinene	4.20	975	12.22	12.22	1048	1.90	Monoterpene
Myrcene	4.45	990	1.54	1.53	1120	2.63	Monoterpene
$\alpha$ -Phellandrene	4.72	1006	0.04	0.03	1114	2.54	Monoterpene
Octanal	4.84	1012	0.05	0.04	1237	4.22	Aliphatic aldehyde
$\alpha$ -Terpinene	4.91	1016	0.12	0.12	1127	2.72	Monoterpene
Limonene	5.24*	1034	67.46	67.38	1156	3.10	Monoterpene
para-Cymene	5.24*	1034	[67.46]	0.43	1214	3.87	Monoterpene
1,8-Cineole	5.24*	1034	[67.46]	0.35	1158	3.11	Monoterp. ether
<i>cis</i> - $\beta$ -Ocimene	5.32	1039	0.05	7.92	1198	3.64*	Monoterpene
<i>trans</i> - $\beta$ -Ocimene	5.50	1048	0.10	0.10	1207	3.77	Monoterpene
$\gamma$ -Terpinene	5.71	1060	7.82	[7.92]	1198	3.64*	Monoterpene
<i>cis</i> -Sabinene hydrate	5.97	1074	0.03	0.03	1412	6.96	Monoterp. alcohol
Terpinolene	6.15	1084	0.30	0.30	1228	4.09	Monoterpene
Linalool	6.56	1104	0.11	0.09	1502	9.13	Monoterp. alcohol
Nonanal	6.72	1110	0.07	0.06	1340	5.77	Aliphatic aldehyde
<i>cis</i> -Limonene oxide	7.27	1130	0.02	0.02	1377	6.36	Monoterp. ether
<i>trans</i> -Limonene oxide	7.38	1134	0.01	0.01	1390	6.57	Monoterp. ether
Citronellal	7.88	1152	0.04	0.04	1420	7.17	Monoterp. aldehyde
Terpinen-4-ol	8.61	1179	0.04	0.03	1533	10.21	Monoterp. alcohol
$\alpha$ -Terpineol	9.20	1201	0.16	0.15	1630	14.10	Monoterp. alcohol
Decanal	9.67	1211	0.03	0.03	1441	7.65	Aliphatic aldehyde
Nerol	10.32	1225	0.05	0.06	1737	20.08	Monoterp. alcohol
Neral	10.95	1239	0.80	0.81	1607	12.96	Monoterp. aldehyde
Geraniol	11.57	1253	0.04	0.05	1790	23.56	Monoterp. alcohol
Geranial	12.44	1272	1.31	1.29	1655	15.40	Monoterp. aldehyde
Undecanal	14.49	1312	0.02	0.01	1544	10.63	Aliphatic aldehyde
Citronellyl acetate	17.04	1351	0.02	0.02	1615	13.31	Monoterp. ester
Neryl acetate	17.63	1360	0.40	0.42	1666	15.94	Monoterp. ester
Geranyl acetate	19.09	1382	0.25	0.27	1697	17.64	Monoterp. ester
$\beta$ -Caryophyllene	20.29	1400	0.22	0.21	1522	9.78	Sesquiterpene
<i>cis</i> - $\alpha$ -Bergamotene	20.42	1402	0.02	0.01	1510	9.38	Sesquiterpene
<i>trans</i> - $\alpha$ -Bergamotene	21.90	1420	0.36	0.36	1528	10.02	Sesquiterpene
<i>trans</i> - $\beta$ -Farnesene	24.21	1447	0.05	0.04	1619	13.54	Sesquiterpene
Bicyclogermacrene	26.43	1474	0.04	0.04	1644	14.82	Sesquiterpene

$\beta$ -Bisabolene	28.48	1499	0.54	0.53	1660	15.71	Sesquiterpene
<b>Total identified</b>	<b>98.41%</b>		<b>99.07%</b>				

\*: 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 :**  $1.4725 \pm 0.0003$  (20 °C)

#### CONCLUSION

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



