



**PLANT THERAPY**  
100% PURE ESSENTIAL OILS

## GC/MS BATCH NUMBER: L60106

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**ESSENTIAL OIL:** LEMON

**BOTANICAL NAME:** CITRUS X LIMON

**ORIGIN:** USA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF LEMON OIL	%
LIMONENE	66.9
β-PINENE	13.3
CIS-β-OCIMENE	7.9
γ-TERPINENE	7.8
α-PINENE	2.3
GERANIAL	1.7
SABINENE	1.5
MYRCENE	1.5
NERAL	1.1

Comments from Robert Tisserand: Mouth-watering fresh citrus odor quality. Meets 11 of 13 ISO constituents for US coast type, with two marginal - not a concern.

**Date :** February 16, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17A30-PTH13-1-DM

**Customer identification :** Lemon - L6010667R

**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 :** 2017-02-13

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.	
$\alpha$ -Thujene	3.29	921	0.29	0.34	963	1.27	Monoterpene
$\alpha$ -Pinene	3.39	927	2.26	2.18	953	1.23	Monoterpene
$\alpha$ -Fenchene	3.67*	944	0.05	tr	992	1.47	Monoterpene
Camphene	3.67*	944	[0.05]	0.04	999	1.53	Monoterpene
Sabinene	4.10	970	1.52	1.58	1062	2.09	Monoterpene
$\beta$ -Pinene	4.19	975	13.27	13.15	1046	1.95	Monoterpene
Myrcene	4.44	990	1.47	1.45	1118	2.68	Monoterpene
Pseudolimonene	4.65	1002	0.02	0.01	1114	2.62	Monoterpene
$\alpha$ -Phellandrene	4.71*	1005	0.10	0.07	1111	2.58	Monoterpene
$\Delta^3$ -Carene	4.71*	1005	[0.10]	0.03	1097	2.39	Monoterpene
Octanal	4.83	1012	0.06	0.06	1233	4.28	Aliphatic aldehyde
$\alpha$ -Terpinene	4.90	1015	0.13	0.14	1125	2.77	Monoterpene
Limonene	5.22*	1033	67.52	66.92	1153	3.14	Monoterpene
para-Cymene	5.22*	1033	[67.52]	0.42	1211	3.94	Monoterpene
1,8-Cineole	5.22*	1033	[67.52]	0.42	1154	3.16	Monoterp. ether
cis- $\beta$ -Ocimene	5.24	1034	0.24	7.89	1195	3.70*	Monoterpene
trans- $\beta$ -Ocimene	5.48	1048	0.07	0.07	1204	3.84	Monoterpene
$\gamma$ -Terpinene	5.69	1059	7.77	[7.89]	1195	3.70*	Monoterpene
cis-Sabinene hydrate	5.98	1075	tr	0.01	1405	7.07	Monoterp. alcohol
Terpinolene	6.13	1083	0.31	0.29	1225	4.15	Monoterpene
Linalool	6.55	1104	0.05	0.05	1496	9.31	Monoterp. alcohol
Nonanal	6.71	1110	0.05	0.05	1335	5.84	Aliphatic aldehyde
cis-Limonene oxide	7.26	1130	0.02	0.02	1372	6.45	Monoterp. ether
trans-Limonene oxide	7.38	1134	0.01	0.01	1387	6.67	Monoterp. ether
Citronellal	7.86	1152	0.06	0.06	1414	7.28	Monoterp. aldehyde
Terpinen-4-ol	8.59	1178	0.04	0.03	1526	10.42	Monoterp. alcohol
$\alpha$ -Terpineol	9.17	1200	0.13	0.10	1621	14.40	Monoterp. alcohol
Decanal	9.65	1211	0.06	0.06	1434	7.77	Aliphatic aldehyde
Neral	10.92	1239	1.08	1.11	1599	13.23	Monoterp. aldehyde
Geranial	12.39	1271	1.66	1.66	1646	15.72	Monoterp. aldehyde
Citronellyl acetate	17.00	1350	0.02	0.02	1609	13.77	Monoterp. ester
Neryl acetate	17.58	1359	0.31	0.33	1655	16.25	Monoterp. ester
Geranyl acetate	19.04	1381	0.20	0.20	1689	17.98	Monoterp. ester
$\beta$ -Caryophyllene	20.22	1399	0.15	0.17	1513	9.96	Sesquiterpene
trans- $\alpha$ -Bergamotene	21.82	1419	0.16	0.16	1520	10.19	Sesquiterpene
$\beta$ -Bisabolene	28.38	1497	0.25	0.24	1650	15.98	Sesquiterpene
<b>Total identified</b>			<b>99.33%</b>	<b>99.34%</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

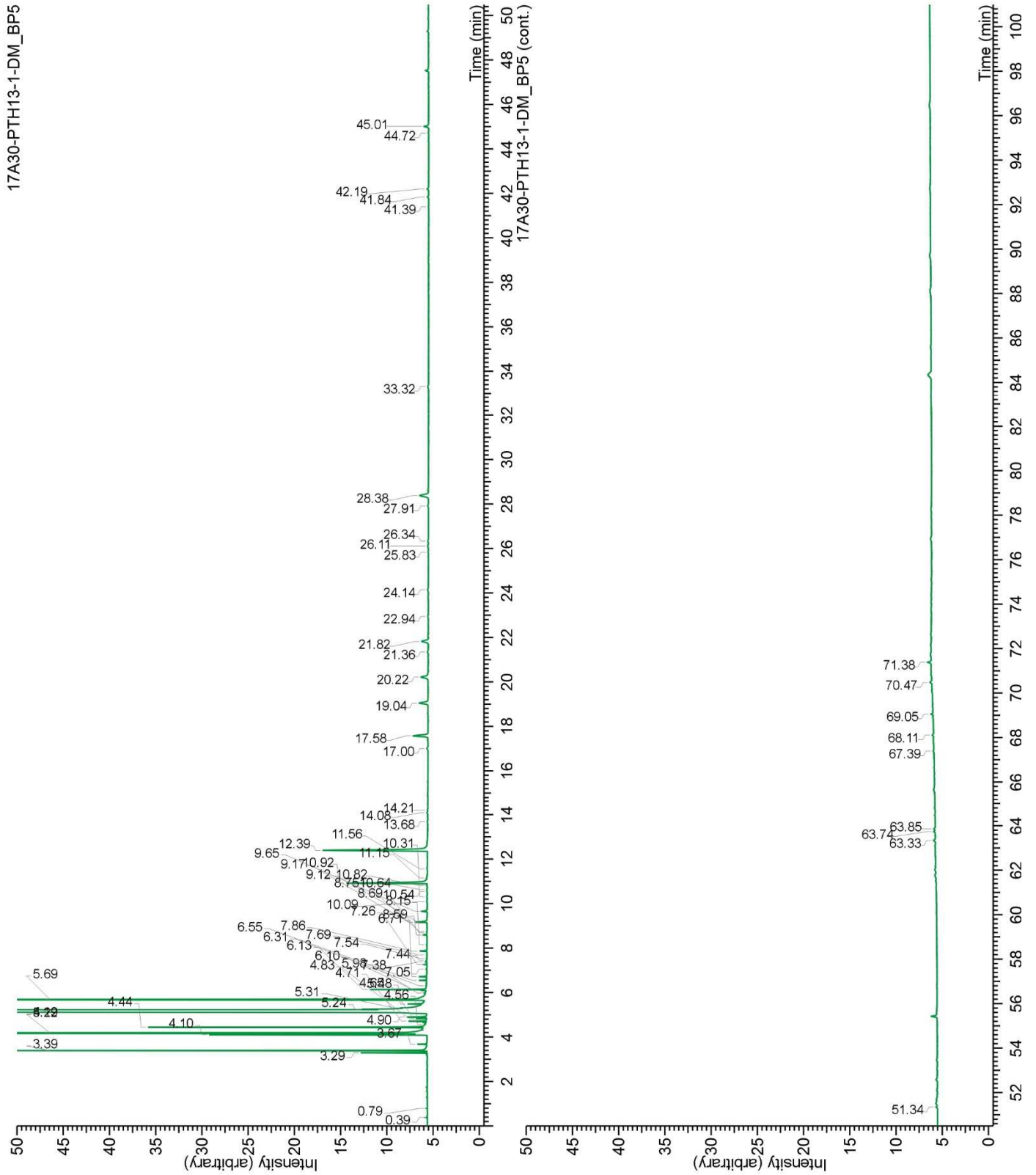
*OTHER DATA*

**Physical aspect :** Light yellow liquid

**Refractive index :**  $1.4740 \pm 0.0003$  (20 °C)

*CONCLUSION*

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



17A30-PTH13-1-DM\_WAX

