

GC/MS BATCH NUMBER: LA0105

ESSENTIAL OIL: LIME

BOTANICAL NAME: CITRUS X AURANTIFOLIA

ORIGIN: MEXICO

KEY CONSTITUENTS PRESENT IN THIS BATCH OF LIME OIL	%
LIMONENE	48.0
β-PINENE	16.7
γ-TERPINENE	10.8
SABINENE	2.6
GERANIAL	2.4
β-BISABOLENE	2.2
α-PINENE	2.1
NERAL	1.5
trans-α-BERGAMOTENE	1.4
MYRCENE	1.1
(E,E)-α-FARNESENE	1.0
β-CARYOPHYLLENE	1.0

Comments from Robert Tisserand: Fresh, green, citrus-zesty odor profile. Sixteen of eighteen key ISO constituents are within range, with beta-pinene slightly low and beta-bisabolene slightly high.

Date : October 18, 2017

SAMPLE IDENTIFICATION

Internal code : 17J04-PTH2-1-CC

Customer identification : Lime - Mexico - LA010578R

Type : Essential oil

Source : *Citrus x aurantifolia*

Customer : Plant Therapy

ANALYSIS

Method : PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

Identifications double-checked by GC-MS

Analyst : Sylvain Mercier, M. Sc., chimiste

Analysis date : 2017-10-18

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.	
Nonane	2.89	895	0.01	0.01	782	0.69	Alkane
α -Thujene	3.31	920	0.39	0.98	962	1.21	Monoterpene
α -Pinene	3.42	926	2.07	1.49	954	1.18	Monoterpene
Camphene	3.70	943	0.09	0.08	1004	1.47	Monoterpene
Sabinene	4.15	969	2.60	3.48	1058	2.02	Monoterpene
β -Pinene	4.23	975	16.73	15.99	1044	1.86	Monoterpene
Myrcene	4.48	989	1.14	1.37	1120	2.61*	Monoterpene
6-Methyl-5-hepten-2-one	4.56	994	0.01	0.01	1279	4.83	Aliphatic ketone
α -Phellandrene	4.75	1005	0.04	0.02	1114	2.52	Monoterpene
Octanal	4.87	1011	0.02	0.58	1229	4.08*	Aliphatic aldehyde
α -Terpinene	4.94	1015	0.20	[1.37]	1120	2.61*	Monoterpene
Limonene	5.26*	1032	47.79	47.95	1153	3.03	Monoterpene
para-Cymene	5.26*	1032	[47.79]	0.49	1213	3.85	Monoterpene
cis- β -Ocimene	5.36	1037	0.13	10.97	1196	3.61*	Monoterpene
trans- β -Ocimene	5.54	1047	0.33	0.36	1207	3.76	Monoterpene
γ -Terpinene	5.76	1059	10.77	[10.97]	1196	3.61*	Monoterpene
cis-Sabinene hydrate	6.06	1076	0.03	0.02	1408	6.87	Monoterp. alcohol
Terpinolene	6.20	1083	0.54	[0.58]	1229	4.08*	Monoterpene
Linalool	6.69	1106	0.19	0.16	1499	9.04	Monoterp. alcohol
1-Terpineol	7.62	1140	0.02	0.01	1509	9.36	Monoterp. alcohol
Citronellal	7.97	1152	0.06	0.25	1420	7.17*	Monoterp. aldehyde
Borneol	8.64	1177	0.03	0.04	1615	13.42	Monoterp. alcohol
Terpinen-4-ol	8.80	1182	0.20	1.84	1530	10.13*	Monoterp. alcohol
α -Terpineol	9.47	1203	0.28	0.72	1624	13.87*	Monoterp. alcohol
Decanal	9.80	1211	0.19	0.17	1440	7.64	Aliphatic aldehyde
Nerol	10.58	1228	0.05	0.09	1732	19.81	Monoterp. alcohol
Neral	11.18	1241	1.53	1.54	1603	12.80	Monoterp. aldehyde
Geraniol	11.87	1256	0.04	0.07	1784	23.25	Monoterp. alcohol
Geranial	12.72	1275	2.39	2.52	1650	15.21*	Monoterp. aldehyde
δ -Elemene	15.32	1321	0.18	[0.25]	1420	7.17*	Sesquiterpene
Neryl acetate	17.85	1359	0.43	3.12	1663	15.93*	Monoterp. ester
β -Elemene	18.92	1376	0.12	[1.84]	1530	10.13*	Sesquiterpene
Geranyl acetate	19.35	1382	0.30	1.41	1698	17.73*	Monoterp. ester
β -Caryophyllene	20.61	1400	1.04	0.94	1523	9.87	Sesquiterpene
Dodecanal	21.73	1414	0.12	[2.52]	1650	15.21*	Aliphatic aldehyde
trans- α -Bergamotene	22.19	1419	1.42	[1.84]	1530	10.13*	Sesquiterpene
cis- β -Farnesene	22.44	1422	0.05	0.17	1586	12.15*	Sesquiterpene
α -Humulene	23.39	1433	0.11	[0.17]	1586	12.15*	Sesquiterpene
trans- β -Farnesene	24.51	1447	0.14	[0.72]	1624	13.87*	Sesquiterpene
Germacrene D	25.61	1460	0.24	[0.72]	1624	13.87*	Sesquiterpene
α -Selinene	26.87	1475	0.05	[2.52]	1650	15.21*	Sesquiterpene

<i>cis</i> - α -Bisabolene	27.78	1486	0.22	[3.12]	1663	15.93*	Sesquiterpene
γ -Cadinene	28.40	1493	0.17	[3.12]	1663	15.93*	Sesquiterpene
β -Bisabolene	28.92	1500	2.21	[3.12]	1663	15.93*	Sesquiterpene
(<i>E,E</i>)- α -Farnesene	29.13	1503	1.04	[1.41]	1698	17.73*	Sesquiterpene
δ -Cadinene	29.43	1507	0.21	0.22	1678	16.68	Sesquiterpene
<i>trans</i> - α -Bisabolene	31.86	1541	0.04	0.06	1712	18.51	Sesquiterpene
Germacrene B	32.04	1544	0.54	0.56	1725	19.35	Sesquiterpene
α -Bisabolol	39.56	1687	0.11	0.13	2137	40.90	Sesquiterp. alcohol
Bergapten	49.84	2060	0.08				Coumarin
Oxypeucedanin	58.56	2475	0.09				Coumarin
Total identified			96.78%	97.82%			

*: 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

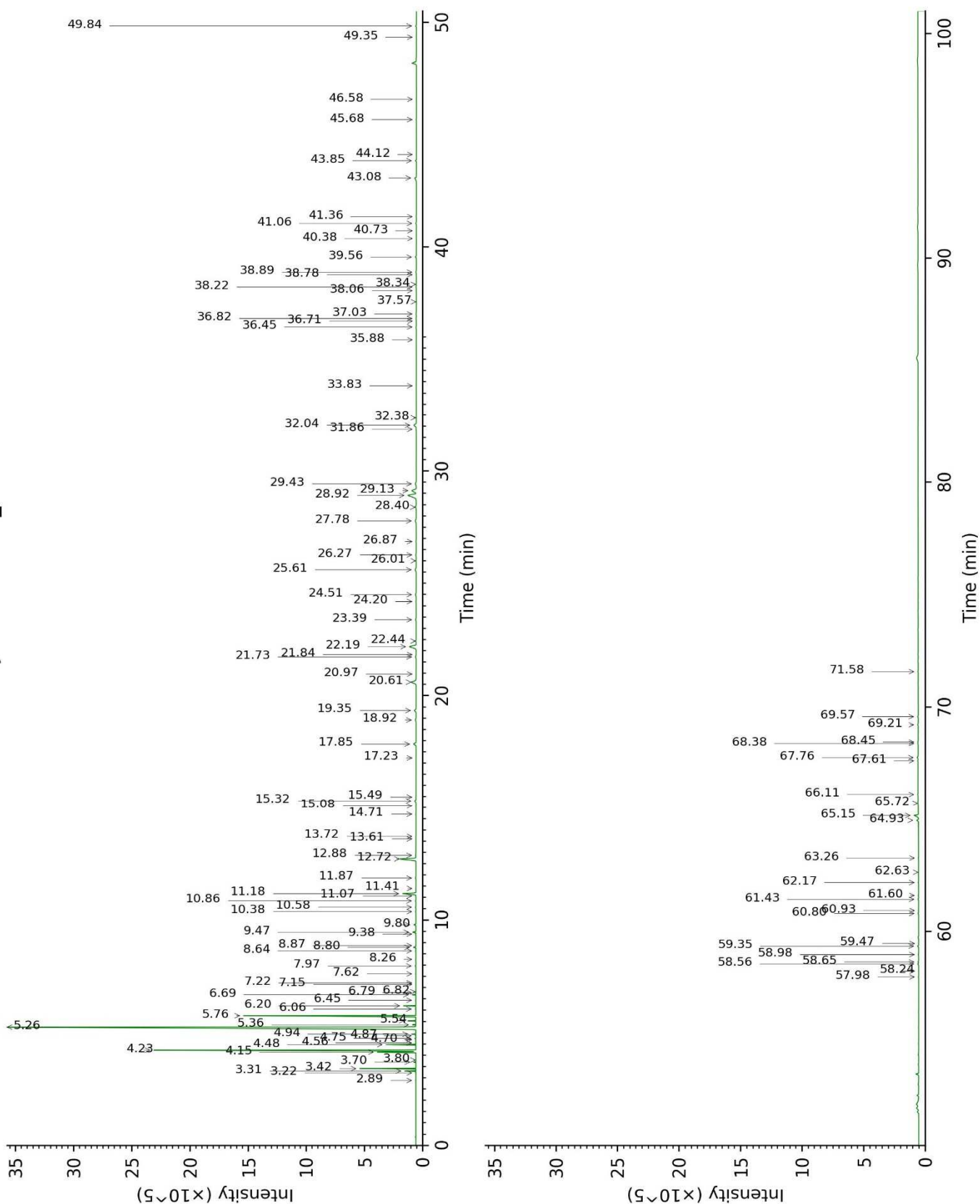
Physical aspect : Bright yellow liquid

Refractive index : 1.4825 $\pm$ 0.0003 (20 °C)

CONCLUSION

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

17J04-PTH2-1-CC_BP5



17J04-PTH2-1-CC_WAX

