



Essential Validation Services



Sample:

Client: | Root
 Sample: | Lemon (Citrus x limon)
 Batch # | Organic Lemon 3W-2
 CAS Number | 8008-56-8
 Type: | Essential Oil

Conclusion:

- No adulterants, diluents, or contaminants were detected via this method.
- This oil meets the expected profile for genuine Lemon (Citrus x limon).



X *Adam Christen*

Validated By:

Essential Validation Services

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Summary of Analyses

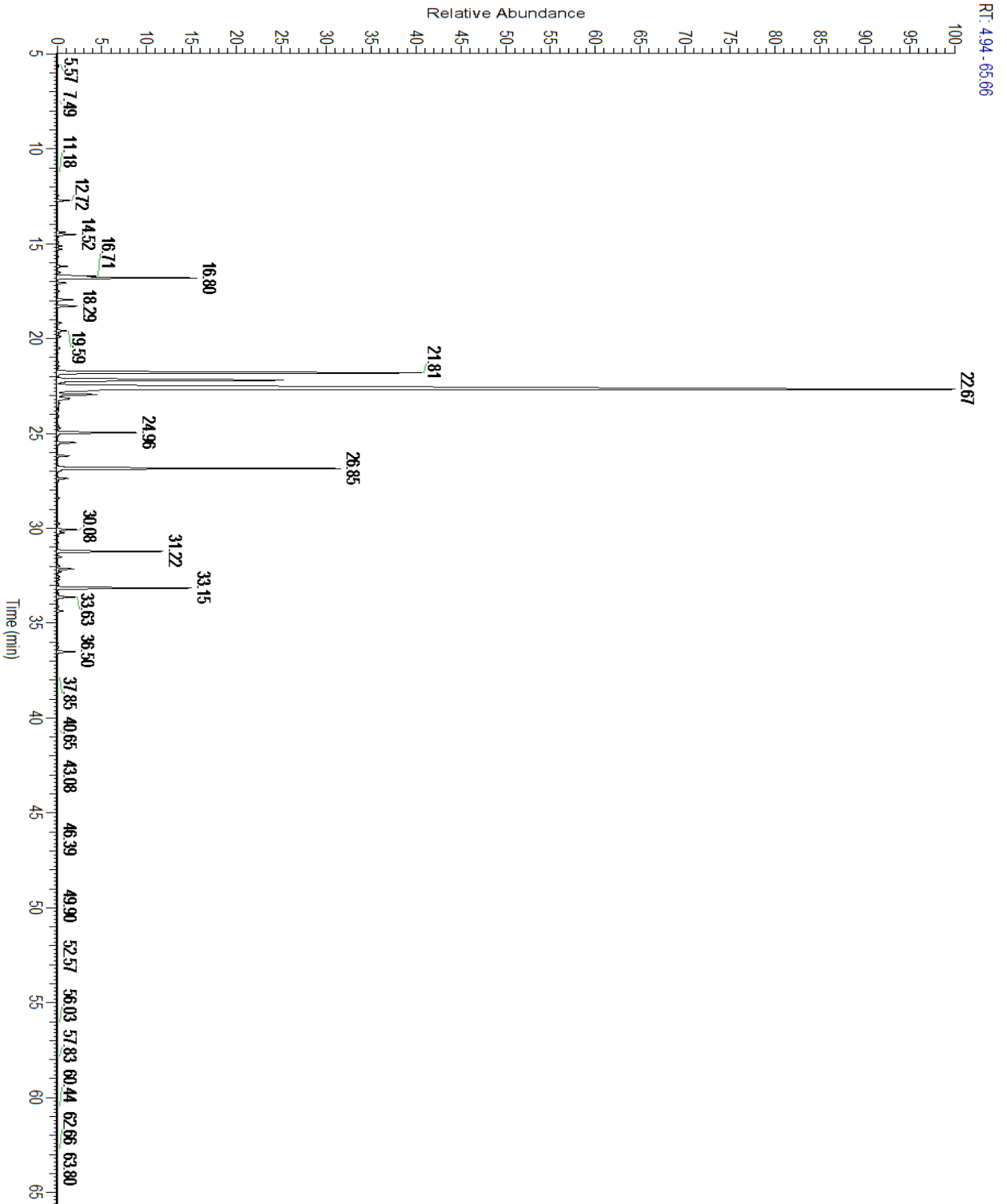
A fresh sample of Lemon (Citrus x limon) (10 uL in .5to.5 mL Hexane + ETOH) was prepared and analyzed via split injection GC/EI-MS.

Main Compounds	Percentages
Limonene	65.06%
beta-Pinene	11.52%
gamma-Terpinene	10.48%
Geranial	2.01%
alpha-Pinene	1.78%
Sabinene	1.75%
Myrcene	1.52%
Neral	1.16%
Neryl acetate	0.63%
Geranyl acetate	0.49%
beta-Bisabolene	0.45%
alpha-Thujene	0.39%
Terpinolene	0.34%

Monoterpenes	Sesquiterpenes	Monoterpenols	Sesquiterpenols	Ketones
93.53%	0.94%	0.38%	0.00%	0.00%
Esters	Ethers	Aldehydes	Phenols	Other
1.12%	0.00%	3.30%	0.00%	0.73%



- Monoterpenes ■ Sesquiterpenes ■ Monoterpenols
- Sesquiterpenols ■ Ketones ■ Esters
- Ethers ■ Phenols ■ Other



Total Percentage		99.27%			
Peak Number	RT	Area %	Compound Name	RI	Chemical Family
1	12.48	0.39%	alpha-Thujene	927.80	Monoterpene
2	12.75	1.78%	alpha-Pinene	936.10	Monoterpene
3	13.38	0.05%	Camphene	950.30	Monoterpene
4	14.44	1.75%	Sabinene	973.00	Monoterpene
5	14.57	11.52%	beta-Pinene	974.00	Monoterpene
6	15.15	1.52%	Myrcene	989.20	Monoterpene
7	15.62	0.05%	Octanal	998.00	Aliphatic Aldehyde
8	15.71	0.04%	alpha-Phellandrene	1002.00	Monoterpene
9	16.23	0.19%	alpha-Terpinene	1014.00	Monoterpene
10	16.58	0.27%	para-Cymene	1024.30	Monoterpene
11	16.87	65.06%	Limonene	1029.50	Monoterpene
12	17.10	0.05%	(Z)-beta-Ocimene	1037.80	Monoterpene
13	17.54	0.09%	(E)-beta-Ocimene	1047.70	Monoterpene
14	18.02	10.48%	gamma-Terpinene	1054.00	Monoterpene
15	18.32	0.03%	trans-Sabinene hydrate	1072.00	Monoterpenol
16	19.19	0.34%	Terpinolene	1092.10	Monoterpene
17	19.59	0.13%	Linalool	1099.00	Monoterpenol
18	21.67	0.07%	Citronellal	1154.50	Monoterpene Aldehyde
19	22.68	0.03%	Terpinen-4-ol	1180.57	Monoterpenol
20	23.16	0.14%	alpha-Terpineol	1191.71	Monoterpenol
21	24.46	0.02%	Citronellol	1229.25	Monoterpenol
22	24.64	0.03%	Nerol	1230.67	Monoterpenol
23	24.93	1.16%	Neral	1246.57	Monoterpene Aldehyde
24	25.97	2.01%	Geranial	1272.00	Monoterpene Aldehyde
25	27.23	0.01%	Undecanal	1305.29	Sesquiterpene Aldehyde
26	29.12	0.63%	Neryl acetate	1362.90	Monoterpene Ester
27	29.74	0.49%	Geranyl acetate	1379.20	Monoterpene Ester
28	31.21	0.18%	beta-Caryophyllene	1427.14	Sesquiterpene
29	31.60	0.29%	trans-alpha-Bergamotene	1435.00	Sesquiterpene
30	32.14	0.02%	(Z)-beta-Farnesene	1453.40	Sesquiterpene
31	33.84	0.45%	beta-Bisabolene	1509.86	Sesquiterpene

