



Aromatic Plant Research Center

We provide uncompromising
quality control for your products.

Customer : doTERRA International
Lot Number : 232502
Date Filled : 09/07/2023

Column : ZB5 (60 m length × 0.25 mm inner diameter × 0.25 µm film thickness)
Instrument : Shimadzu GCMS-QP2010 Ultra
Carrier gas : Helium 80 psi
Temperature ramp : 2 degrees celsius per minute up to 260-degrees celsius
Split ratio : 30:1
Sample preparation : 5%w/v solution with Dichloromethane.



Comments:

The analysis of this Green Mandarin lot revealed no contaminants or adulteration.
The sample meets the expected chemical profile for authentic essential oils of *Citrus nobilis*.

Analysied by : Ambika Poudel
Reviewed by : Dr. Prabodh Satyal



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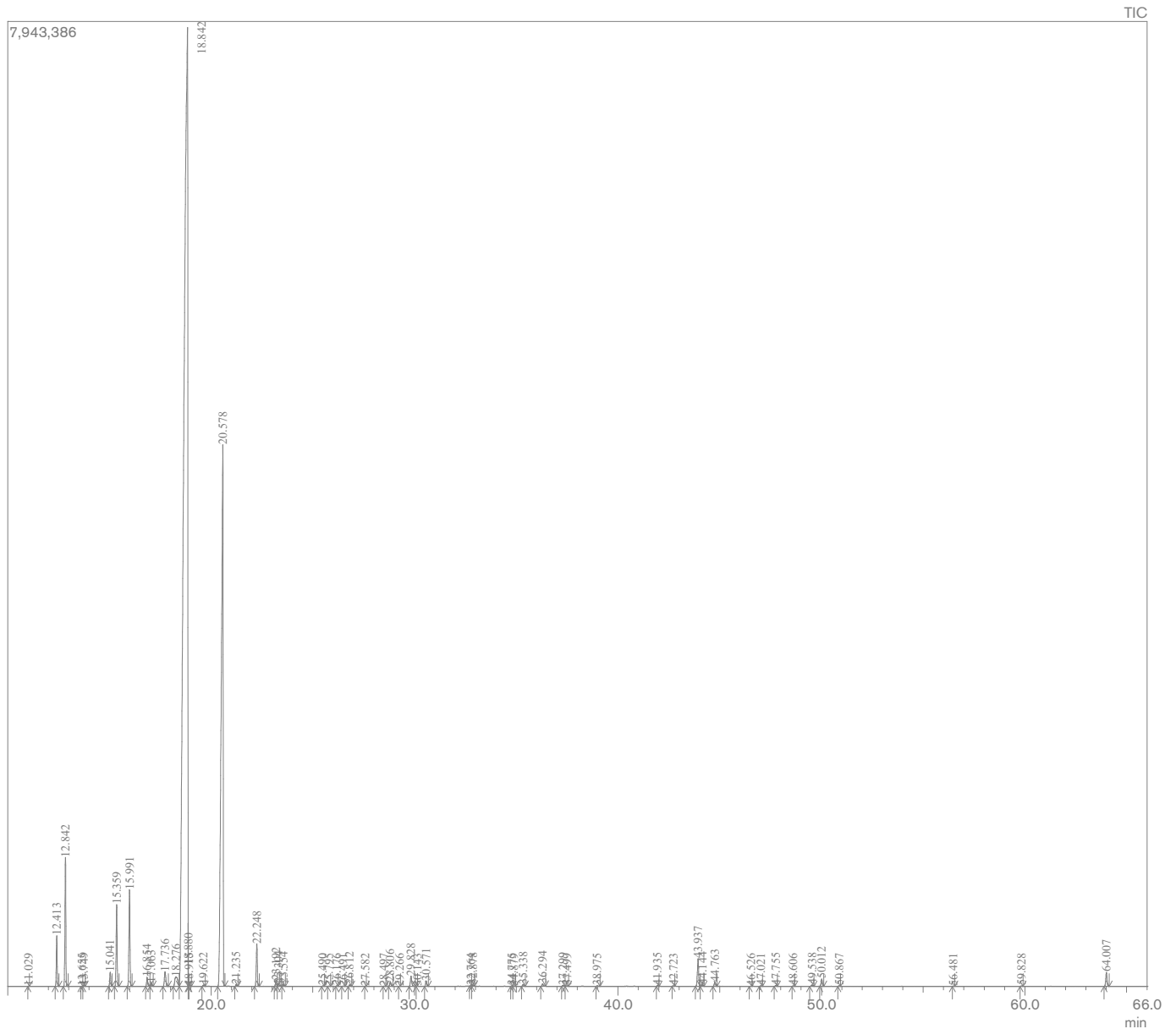
Green Mandarin Essential Oil

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Chromatogram



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Peak Report

Peak#	R.Time	Name	Area%
1	11.029	n-Nonane	0.00
2	12.413	alpha-Thujene	0.82
3	12.842	alpha-Pinene	2.17
4	13.655	alpha-Fenchene	0.00
5	13.749	Camphene	0.02
6	15.041	Sabinene	0.26
7	15.359	beta-Pinene	1.49
8	15.991	Myrcene	1.85
9	16.854	n-Octanal	0.18
10	17.063	alpha-Phellandrene	0.07
11	17.736	alpha-Terpinene	0.38
12	18.276	para-Cymene	0.51
13	18.842	Limonene	69.48
14	18.880	beta-Phellandrene	0.09
15	18.915	cis-beta-Ocimene	0.01
16	19.622	trans-beta-Ocimene	0.02
17	20.578	gamma-Terpinene	19.35
18	21.235	cis-Sabinene hydrate	0.04
19	22.248	Terpinolene	0.84
20	23.192	Linalool	0.13
21	23.304	trans-Sabinene hydrate	0.07
22	23.554	n-Nonanal	0.04
23	25.490	cis-Limonene oxide	0.01
24	25.795	trans-Limonene oxide	0.01
25	26.176	Epoxy terpinolene	0.01
26	26.491	Camphor	0.01
27	26.812	Citronellal	0.04
28	27.582	cis-Isocitral	0.00
29	28.497	trans-Isocitral	0.00
30	28.806	Terpinen-4-ol	0.09
31	29.266	para-Cymen-8-ol	0.00
32	29.828	alpha-Terpineol	0.26
33	30.143	trans-Dihydro carvone	0.00
34	30.571	n-Decanal	0.12
35	32.764	Neral	0.01
36	32.878	cis-Ascaridole	0.03
37	34.775	Geranial	0.01
38	34.879	Isopiperitenone	0.01
39	35.338	Perilla aldehyde	0.05
40	36.294	Thymol	0.06
41	37.299	trans-Ascaridole	0.03
42	37.499	Undecanal	0.02
43	38.975	para-Mentha-1,8-dien-4-hydroperoxide	0.02
44	41.935	alpha-Copaene	0.01
45	42.723	beta-Cubebene	0.01
46	43.937	Methyl N-methyl anthranilate	0.63
47	44.144	Dodecanal	0.04
48	44.763	beta-Caryophyllene	0.10
49	46.526	2-cis-6-trans-Dodecadien-1-al	0.01
50	47.021	alpha-Humulene	0.01
51	47.755	2-trans-Dodecenal	0.02
52	48.606	Germacrene D	0.01
53	49.538	alpha-Selinene	0.04
54	50.012	trans-trans-alpha-Farnesene	0.18
55	50.867	delta-Cadinene	0.01
56	56.481	Tetradecanal	0.01
57	59.828	10-trans-Tetradeceneol	0.01
58	64.007	alpha-Sinensal	0.33
			100.00

