

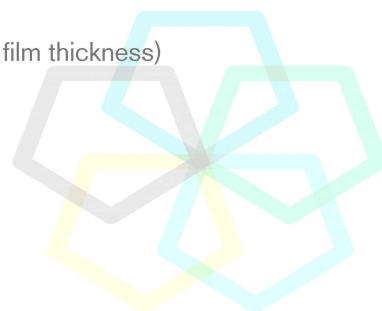


Aromatic Plant Research Center

We provide uncompromising
quality control for your products.

Customer : doTERRA International
Lot Number : 231921
Date Filled : 07/11/2023

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 Fennel lot revealed no contaminants or adulteration.
The sample meets the expected chemical profile for authentic essential oils of *Foeniculum vulgare*.

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



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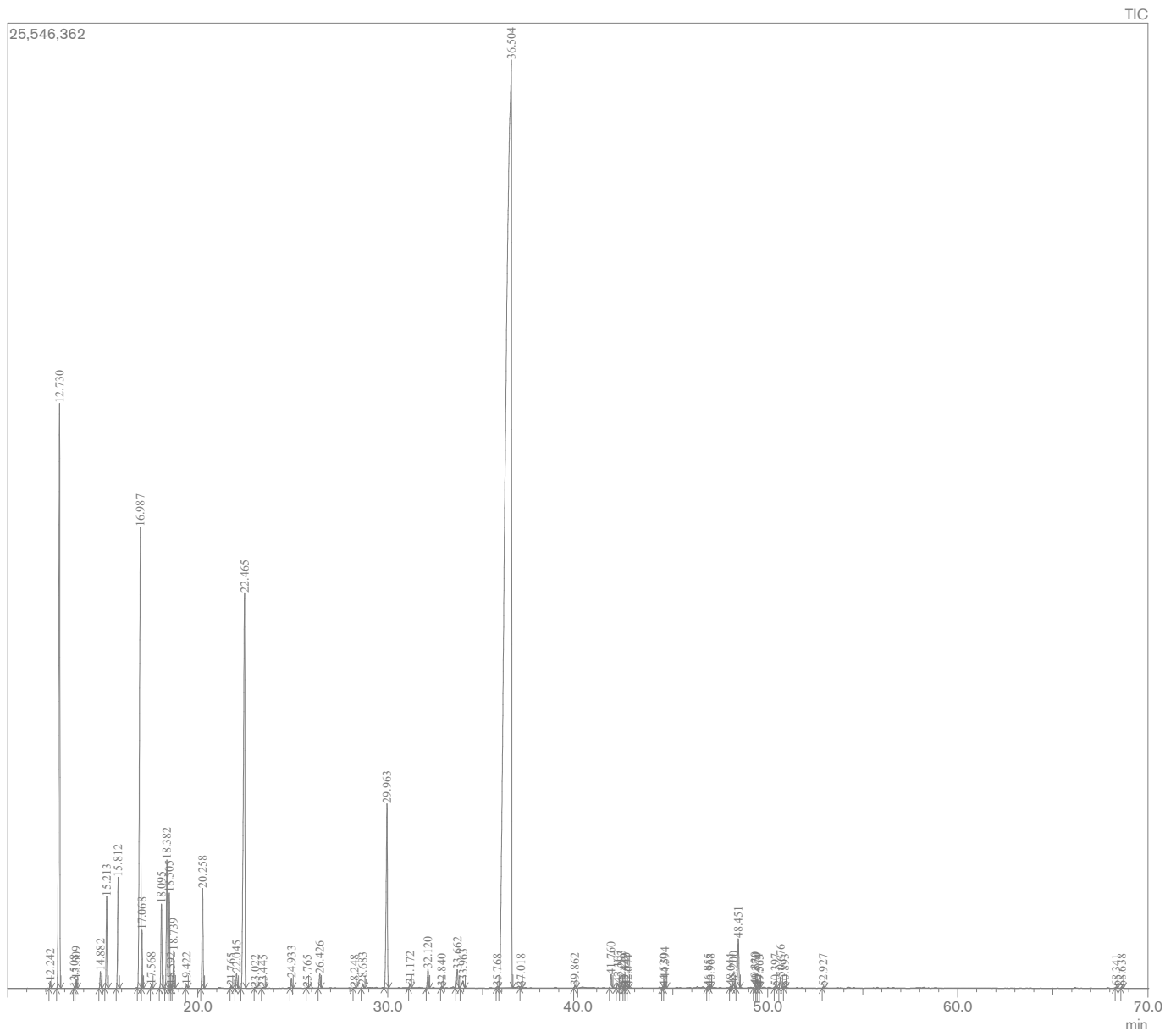
Fennel Essential Oil

Customer : doTERRA International

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Chromatogram



Peak Report

Peak#	R.Time	Name	Area%
1	12.242	alpha-Thujene	0.07
2	12.730	alpha-Pinene	8.10
3	13.508	alpha-Fenchene	0.01
4	13.609	Camphene	0.09
5	14.882	Sabinene	0.18
6	15.213	beta-Pinene	0.97
7	15.812	Myrcene	1.16
8	16.987	alpha-Phellandrene	7.12
9	17.068	delta-3-Carene	0.50
10	17.568	alpha-Terpinene	0.04
11	18.095	para-Cymene	0.99
12	18.382	Limonene	1.57
13	18.505	beta-Phellandrene	0.99
14	18.592	1,8-Cineole	0.03
15	18.739	cis-beta-Ocimene	0.42
16	19.422	trans-beta-Ocimene	0.04
17	20.258	gamma-Terpinene	1.18
18	21.765	para-Mentha-2,4(8)-diene	0.03
19	22.045	Terpinolene	0.18
20	22.465	Fenchone	6.81
21	23.022	Linalool	0.01
22	23.445	Isopentyl isovalerate	0.01
23	24.933	allo-Ocimene	0.12
24	25.765	neo-allo-Ocimene	0.01
25	26.426	Camphor	0.17
26	28.248	exo-Isocamphone	0.01
27	28.683	Terpinen-4-ol	0.05
28	29.963	Methyl chavicol	2.80
29	31.172	endo-Fenchyl acetate	0.05
30	32.120	exo-Fenchyl acetate	0.25
31	32.840	Hexyl isovalerate	0.02
32	33.662	cis-Anethole	0.27
33	33.963	para-Anisaldehyde	0.15
34	35.768	Bornyl acetate	0.02
35	36.504	trans-Anethole	63.85
36	37.018	Butanoic acid 2-methyl-4-methyl hexyl ester	0.01
37	39.862	alpha-Cubebene	0.03
38	41.760	alpha-Copaene	0.18
39	42.107	2-Methoxy phenyl acetone	0.07
40	42.293	Anisyl methyl ketone	0.08
41	42.439	Hexyl hexanoate	0.02
42	42.540	beta-Cubebene	0.03
43	42.644	beta-Elemene	0.02
44	44.520	beta-Ylangene	0.02
45	44.594	beta-Caryophyllene	0.13
46	46.855	alpha-Humulene	0.02
47	46.968	Neryl propanoate	0.02
48	48.044	trans-Cadina-1(6),4-diene	0.02
49	48.200	gamma-Curcumene	0.06
50	48.451	Germacrene D	0.70
51	49.330	Bicyclogermacrene	0.05
52	49.370	trans-Methyl isoeugenol	0.01
53	49.514	alpha-Murolene	0.02
54	49.565	Valencene	0.00
55	50.397	gamma-Cadinene	0.02
56	50.676	delta-Cadinene	0.15
57	50.893	Myristicin	0.02
58	52.927	Geranyl butyrate	0.02
59	68.341	Neophytadiene	0.01
60	68.638	Phytone	0.02
			100.00

