

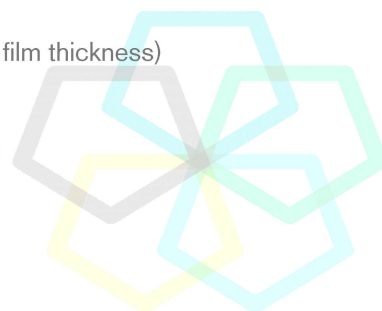


Aromatic Plant Research Center

We provide uncompromising
quality control for your products.

Customer : doTERRA International
Lot Number : 2233313
Date Filled : 11/29/2022

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 Geranium lot revealed no contaminants or adulteration.
The sample meets the expected chemical profile for authentic essential oils of Pelargonium graveolens.

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



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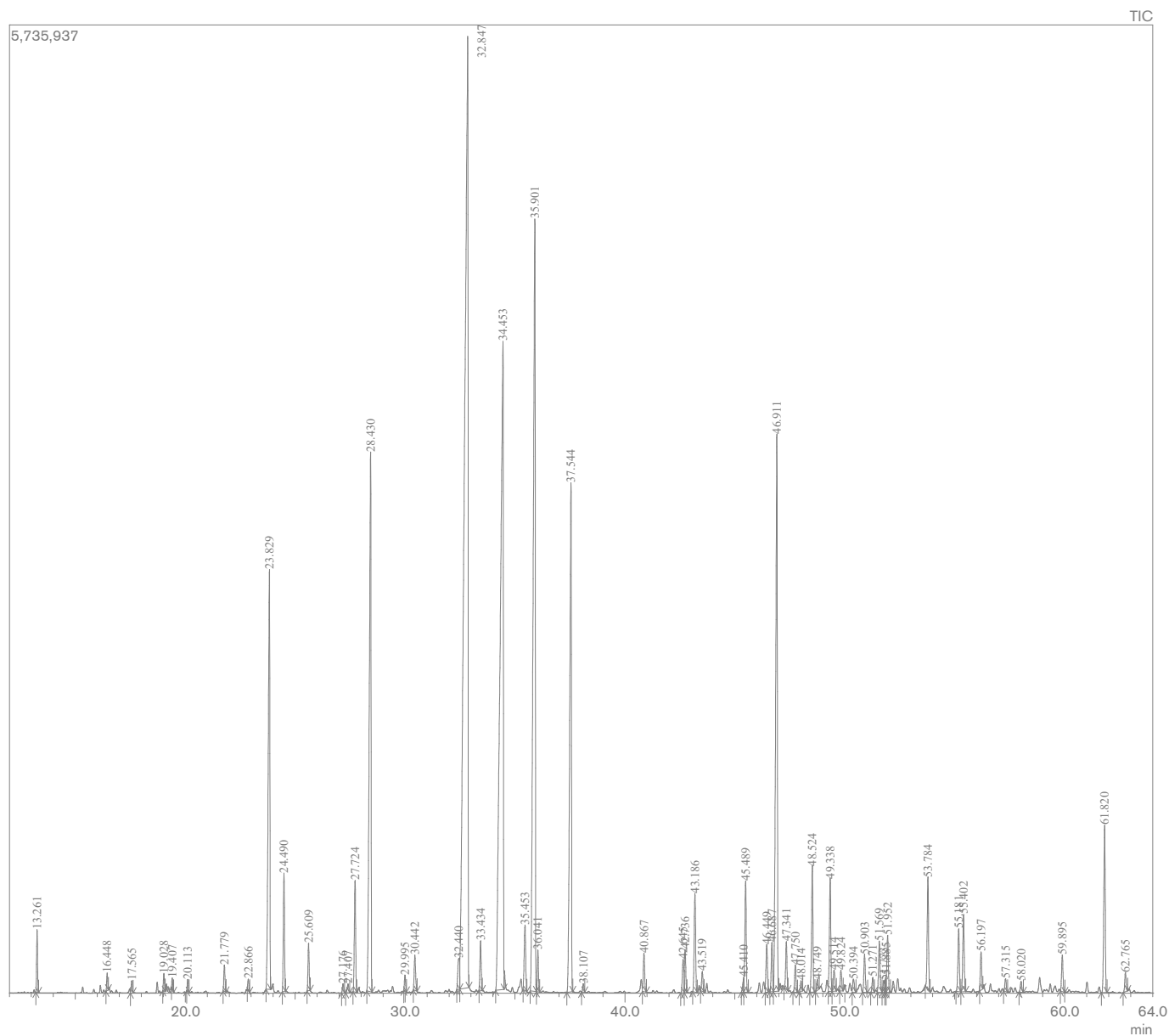
Geranium Essential Oil

Customer : doTERRA International

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Chromatogram



Peak Report

Peak#	R.Time	Name	Area%
1	13.261	alpha-Pinene	0.43
2	16.448	Myrcene	0.12
3	17.565	alpha-Phellandrene	0.10
4	19.028	Limonene	0.13
5	19.407	cis-beta-Ocimene	0.07
6	20.113	trans-beta-Ocimene	0.09
7	21.779	cis-Linalool oxide (furanoid)	0.22
8	22.866	trans-Linalool oxide (furanoid)	0.08
9	23.829	Linalool	5.04
10	24.490	cis-Rose oxide	1.03
11	25.609	trans-Rose oxide	0.40
12	27.176	trans-Chrysanthanal	0.09
13	27.407	Citronellal	0.10
14	27.724	Menthone	1.04
15	28.430	Isomenthone	6.80
16	29.995	Menthol	0.13
17	30.442	alpha-Terpineol	0.36
18	32.440	Nerol	0.44
19	32.847	Citronellol	25.22
20	33.434	Neral	0.44
21	34.453	Geraniol	15.11
22	35.453	Geranial	0.70
23	35.901	Citronellyl formate	11.73
24	36.041	Neryl formate	0.33
25	37.544	Geranyl formate	6.51
26	38.107	Terpineol acetate	0.08
27	40.867	Citronellyl acetate	0.37
28	42.645	alpha-Copaene	0.38
29	42.736	Geranyl acetate	0.39
30	43.186	beta-Bourbonene	1.03
31	43.519	beta-Elementene	0.19
32	45.410	beta-Ylangene	0.12
33	45.489	beta-Caryophyllene	1.16
34	46.449	alpha-Guaiene	0.52
35	46.687	Citronellyl propionate	0.48
36	46.911	6,9-Guaiadiene	7.01
37	47.341	Isogermaacrene D	0.46
38	47.750	alpha-Humulene	0.27
39	48.014	allo-Aromadendrene	0.10
40	48.524	Geranyl propionate	1.25
41	48.749	cis-Cadina-1(6),4-diene	0.11
42	49.338	Germaacrene D	1.19
43	49.514	gamma-Murolene+Phenylethyl-2-methylbutanoate	0.24
44	49.824	beta-Selinene	0.21
45	50.394	alpha-Murolene	0.16
46	50.903	Geranyl isobutanoate	0.41
47	51.271	gamma-Cadinene	0.15
48	51.569	delta-Cadinene	0.55
49	51.773	trans-Calamenene	0.13
50	51.885	Zonarene	0.13
51	51.952	Citronellyl butanoate	0.61
52	53.784	Geranyl butanoate	1.13
53	55.181	Furopolargone B	0.65
54	55.402	Phenyl ethyl tiglate	0.79
55	56.197	Geranyl isovalerate	0.37
56	57.315	1,10-Di-epi-cubenol	0.14
57	58.020	1-epi-Cubenol	0.11
58	59.895	Citronellyl tiglate	0.37
59	61.820	Geranyl tiglate	1.81
60	62.765	Geranyl caproate	0.20
			100.00

