

Date: September 25th, 2020

CERTIFICATE OF ANALYSIS - GC PROFILING

Sample identification: Pine Needle – 200790390

Type: Essential oil

Source: Pinus sylvestris

ANALYSIS

Method: 10152018_10:1split.m - Analysis of the composition of an essential oil, or other volatile liquid, by GC-FID, identifications validated by GC-MS.

Analysis date: Date: September 24th, 2020

Physical aspect: Colorless liquid

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method.

Analyzed and approved by:

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Peak	Compound	RT	Area Sum %
1	Santene	7.052	0.07
2	Tricyclene	8.608	0.15
3	α -Thujene	8.969	0.03
4	α -Pinene	9.392	53.64
5	Camphene	9.944	1.41
6	Thuja-2,4(10)-diene	10.296	0.04
7	unknown	10.809	0.02
8	unknown	11.232	0.01
9	Sabinene + β -Pinene	11.575	10.89
10	Camphene analog II	12.022	0.1
11	β -Myrcene	12.745	4.72
12	Pseudolimonene	12.926	0.04
13	α -Phellandrene	13.294	0.29
14	δ 3-carene	13.765	11.06
15	α -Terpinene	14.16	0.41
16	p-Cymene	14.724	0.86
17	β -Phellandrene + Limonene + 1,8-Cineole	15.049	9.1
18	(Z)- β -Ocimene	15.949	0.02
19	(E)- β -Ocimene	16.654	0.06
20	γ -Terpinene	17.194	0.16
21	unknown	18.161	0.01
22	α -Terpinolene	19.374	0.9
23	α -Pinene oxide	19.962	0.01
24	Linalool	20.622	0.02
25	endo-Fenchol	21.198	0.06
26	trans-Pinocarveol	23.084	0.05
27	trans-Verbenol	23.796	0.03
28	unknown	24.072	0.02
29	Isoborneol	24.601	0.01
30	unknown	24.912	0.02
31	cis-Verbenol	25.127	0.01
32	Borneol	25.34	0.09
33	α -Phellandrene-8-ol	25.682	0.03
34	Terpinen-4-ol	26.391	0.03
35	p-Cymen-8-ol	27.239	0.02
36	α -Terpineol	27.572	0.7
37	Myrtenal	27.863	0.01
38	Myrtenol	28.019	0.02
39	Methyl chavicol	28.318	0.02
40	Verbenone	29.039	0.02

41	Bornyl acetate	35.521	0.82
42	α -Longipinene	40.207	0.07
43	α -Cubebene	40.591	0.06
44	Cyclosativene II	41.635	0.03
45	α -Copaene	42.511	0.12
46	Longifolene	44.398	0.63
47	β -Caryophyllene	45.791	2.33
48	α -Humulene	48.402	0.24
49	trans-Cadina-1(6),4-diene	50.237	0.06
50	α -Muurolene	52.406	0.04
51	γ -Cadinene	53.287	0.03
52	δ -Cadinene	54.185	0.21
53	unknown	54.676	0.02
54	α -Elemol	56.064	0.01
55	Caryophyllene oxide	58.073	0.06
56	Guaiol	59.602	0.02
57	Bulnesol	63.234	0.04
58	unknown	67.587	0.03
59	unknown	68.922	0.02
60	unknown	69.399	0.01
	Total identified		99.84%

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