



PLANT THERAPY
100% PURE ESSENTIAL OILS

GC/MS BATCH NUMBER: FE0102

ESSENTIAL OIL: FRANKINCENSE FREREANA ORGANIC

BOTANICAL NAME: BOSWELLIA FREREANA

ORIGIN: SOMALIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF FRANKINCENSE FREREANA ORGANIC OIL	%
α -THUJENE	54.82
p-CYMENE	12.47
SABINENE	6.11
α -PINENE	3.19
TERPINEN-4-ol	2.71
β -BOURBONENE	1.54
1,8-CINEOLE	1.38
β -PHELLANDRENE	1.27
LIMONENE	1.23
α -PHELLANDRENE	1.08

Comments from Robert Tisserand: Fresh, dry, incense-y odor quality with hints of Tea Tree oil. Constituents are in expected amounts.

Date : November 24, 2017

SAMPLE IDENTIFICATION

Internal code : 17K20-PTH5-1-CC

Customer identification : Frankincense Frereana Organic - Somalia - FE010279R

Type : Essential oil

Source : *Boswellia frereana*

Customer : Plant Therapy

ANALYSIS

Method : PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

Identifications double-checked by GC-MS

Analyst : Sylvain Mercier, M. Sc., chimiste

Analysis date : 2017-11-24

Checked and approved by :

Alexis St-Gelais, M. Sc., chimiste 2013-174

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IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
4-Methyl-2-pentanone	0.68	675	0.04				Aliphatic ketone
Toluene	1.32	759	0.04	59.23	976	1.25*	Simple phenolic
cis-Salvene	2.21	843	0.07	0.05	843	0.76	Normonoterpene
trans-Salvene	2.28	848	0.02	0.02	860	0.81	Normonoterpene
Unknown (m/z = 93, 91 (68), 121 (60), 77 (50), 79 (43), 105 (21), 41 (20)... 136 (17))	2.79	887	0.07	0.06	887	0.90	Monoterpene
Unknown (m/z = 93, 91 (77), 121 (62), 77 (55), 79 (44), 105 (23), 92 (21), 41 (21), 107 (20), 43 (17), 136 (17))	3.00	902	0.18	0.21	911	0.99*	Monoterpene
Tricyclene	3.21*	914	0.45	[0.21]	911	0.99*	Monoterpene
Hashishene	3.21*	914	[0.45]	[59.23]	976	1.25*	Monoterpene
α-Thujene	3.39	925	54.82	[59.23]	976	1.25*	Monoterpene
α-Pinene	3.45	928	3.19	[59.23]	976	1.25*	Monoterpene
Unknown (m/z = 91, 92 (49), 65 (12)... 134? (2))	3.66	941	2.70	3.66	1063	2.02*	Monoterpene
Camphene	3.71	944	0.09	0.24	1002	1.41*	Monoterpene
Thuja-2,4(10)-diene	3.80	949	0.03	5.26	1057	1.94*	Monoterpene
Sabinene	4.16	970	6.11	[5.26]	1057	1.94*	Monoterpene
β-Pinene	4.21	973	0.30	0.22	1040	1.76	Monoterpene
3-p-Menthene	4.35	982	0.03	[0.24]	1002	1.41*	Monoterpene
Myrcene	4.48	989	0.32	0.36	1116	2.49*	Monoterpene
6-Methyl-5-hepten-2-one	4.55	993	0.04	0.04	1274	4.68	Aliphatic ketone
2-p-Menthene	4.61	996	0.11	0.15	1045	1.82	Monoterpene
α-Phellandrene	4.76*	1005	1.32	1.08	1110	2.41	Monoterpene
Δ3-Carene	4.76*	1005	[1.32]	0.07	1079	2.22	Monoterpene
α-Terpinene	4.94	1015	0.60	0.61	1123	2.59	Monoterpene
meta-Cymene	5.05*	1021	0.65	[0.36]	1116	2.49*	Monoterpene
Carvomenthene	5.05*	1021	[0.65]	[3.66]	1063	2.02*	Monoterpene
para-Cymene	5.18	1028	12.47	12.64	1211	3.74*	Monoterpene
Limonene	5.20	1029	1.23	0.85	1142	2.83	Monoterpene
β-Phellandrene	5.22	1030	1.27	2.95	1145	2.87*	Monoterpene
1,8-Cineole	5.24	1031	1.38	[2.95]	1145	2.87*	Monoterp. ether
cis-β-Ocimene	5.35	1037	0.04	0.79	1189	3.45*	Monoterpene
trans-β-Ocimene	5.53	1047	0.02	[12.64]	1211	3.74*	Monoterpene
Unknown (m/z = 109, 43 (39), 91 (25), 95 (20)... 119 (15), 137 (19), 152 (1))	5.68	1055	0.23				Oxygenated monoterpene

γ -Terpinene	5.72	1057	0.83	[0.79]	1189	3.45*	Monoterpene
<i>cis</i> -Sabinene hydrate	6.06	1076	0.07	0.08	1406	6.72	Monoterp. alcohol
Terpinolene	6.20	1083	0.19	0.28	1224	3.94	Monoterpene
para-Cymenene	6.42	1095	0.09	0.69	1363	6.04*	Monoterpene
Linalool	6.70	1106	0.11	0.19	1493	8.77	Monoterp. alcohol
α -Thujone	6.74	1108	0.08	0.59	1354	5.89	Monoterp. ketone
<i>cis</i> -Verbenol?	6.96	1116	0.13	0.29	1508	9.13*	Monoterp. alcohol
β -Thujone	7.01	1117	0.57	[0.69]	1363	6.04*	Monoterp. ketone
Dehydrosabinaketone	7.05	1119	0.17	3.14	1527	9.82*	Normonoterp. ketone
<i>trans</i> -para-Mentha-2,8-dien-1-ol	7.23	1125	0.17	0.11	1553	10.77	Monoterp. alcohol
α -Campholenal	7.29	1128	0.06				Monoterp. aldehyde
<i>trans</i> -Pinocarveol	7.57	1138	0.04	0.05	1576	11.62	Monoterp. alcohol
<i>trans</i> -Sabinol	7.67	1142	0.17				Monoterp. alcohol
α -Phellandren-8-ol analog	8.03	1155	0.03				Monoterp. alcohol
Pinocarvone	8.23	1162	0.04	0.14	1475	8.35	Monoterp. ketone
α -Phellandren-8-ol	8.45	1170	0.04				Monoterp. alcohol
Umbellulone	8.51	1172	0.10	0.06	1544	10.42	Monoterp. ketone
<i>cis</i> -Sabinol	8.67	1178	0.29				Monoterp. alcohol
Terpinen-4-ol	8.85	1184	2.71	[3.14]	1527	9.82*	Monoterp. alcohol
Myrtenal	9.39	1202	0.27	[3.14]	1527	9.82*	Monoterp. aldehyde
α -Terpineol	9.49	1204	0.28	0.48	1621	13.46*	Monoterp. alcohol
<i>cis</i> -Piperitol	9.76	1210	0.12				Monoterp. alcohol
Methyl decyl ether	10.49	1226	0.03	0.03	1316	5.30	Aliphatic ether
Cuminal	11.35	1245	0.13	0.16	1667	15.86*	Monoterp. aldehyde
Piperitone	11.81	1255	0.06	[0.48]	1621	13.46*	Monoterp. ketone
Bornyl acetate	12.90	1279	0.09	[0.29]	1508	9.13*	Monoterp. ester
Carvacrol	15.17	1319	0.09	0.13	2120	40.30	Monoterp. alcohol
Methyl undecyl ether	15.55	1325	0.09	0.28	1432	7.33*	Aliphatic ether
α -Copaene	17.67	1357	0.06	[0.28]	1432	7.33*	Sesquiterpene
β -Bourbonene	18.16	1364	1.54	1.74	1455	7.87	Sesquiterpene
β -Elemene	18.92	1376	0.10	[3.14]	1527	9.82*	Sesquiterpene
β -Caryophyllene	20.62	1400	0.19	0.15	1521	9.59	Sesquiterpene
β -Copaene	21.52	1411	0.18	[0.29]	1508	9.13*	Sesquiterpene
Germacrene D	25.61	1460	0.03	[0.48]	1621	13.46*	Sesquiterpene
β -Selinene	26.25	1468	0.01	[0.48]	1621	13.46*	Sesquiterpene
γ -Cadinene	28.69	1497	0.04	0.04	1659	15.42	Sesquiterpene
δ -Cadinene	29.34	1506	0.05	[0.16]	1667	15.86*	Sesquiterpene
Caryophyllene oxide	33.83	1569	0.01	0.84	1850	27.55*	Sesquiterp. ether
τ -Cadinol	37.54	1638	0.04	0.04	2069	38.70	Sesquiterp. alcohol
Dimer of α -phellandrene I	40.43	1712	0.03				Diterpene
Dimer of α -phellandrene II	42.32	1771	0.76	[0.84]	1850	27.55*	Diterpene
Dimer of α -phellandrene III	42.65	1782	0.10				Diterpene

Dimer of α -phellandrene IV	43.30	1803	0.09			Diterpene
Total identified			94.92%	94.07%		

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

Note: no correction factor was applied

OTHER DATA

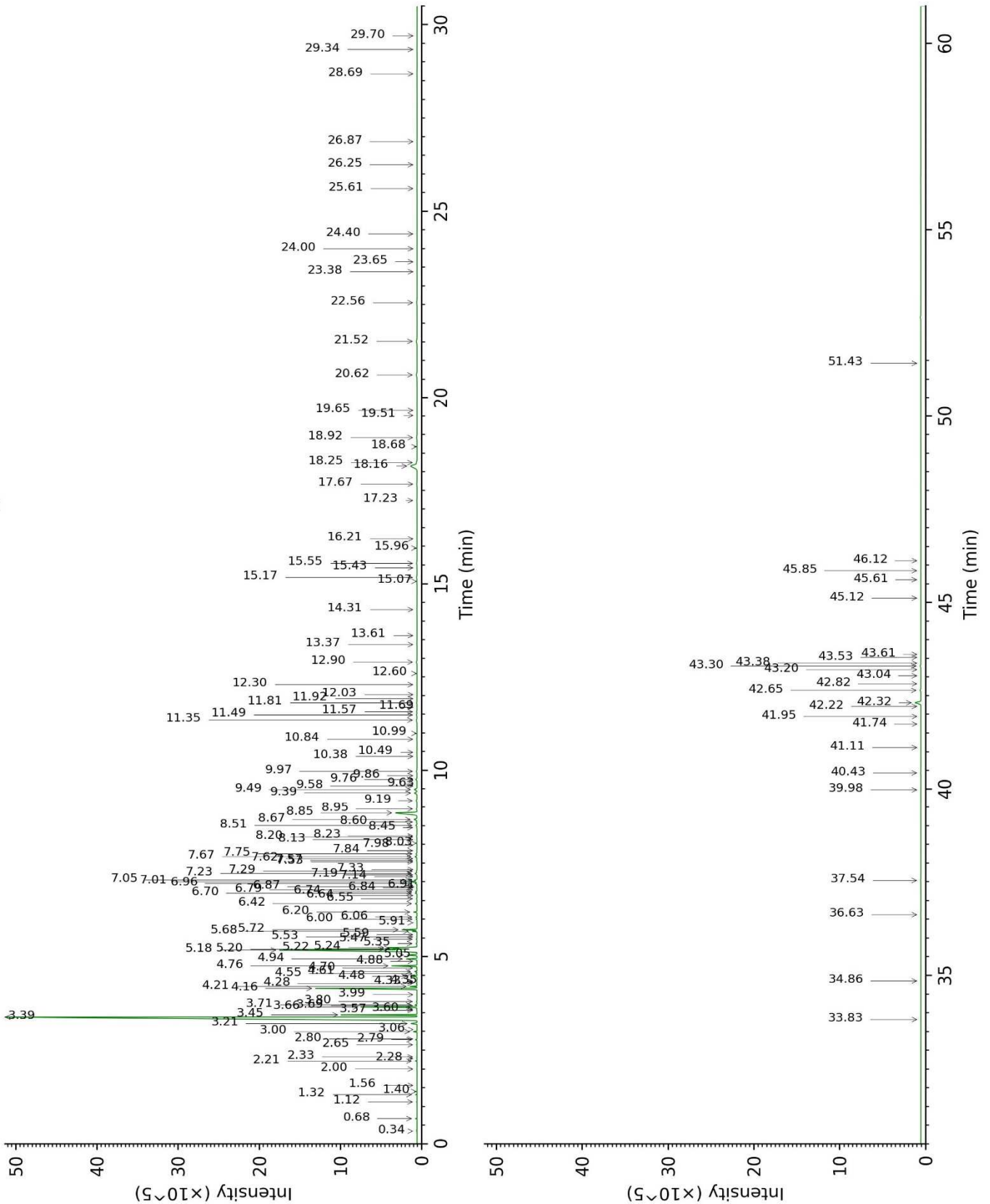
Physical aspect : Faintly yellow liquid

Refractive index : 1.4635 ± 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent were detected using this method.

17K20-PTH5-1-CC_BP5



17K20-PTH5-1-CC_WAX

