



PLANT THERAPY
100% PURE ESSENTIAL OILS

GC/MS BATCH NUMBER: PJ0100

ESSENTIAL OIL: PALO SANTO
BOTANICAL NAME: BURSERA GRAVEOLENS
ORIGIN: ECUADOR

KEY CONSTITUENTS PRESENT IN THIS BATCH OF PALO SANTO OIL	%
LIMONENE	67.3
α -TERPINEOL	9.6
MENTHOFURAN	3.9
CARVONE	2.9
trans-CARVEOL	1.4
PULEGONE	1.3

Comments from Robert Tisserand: Sweet, woody-minty odor quality. Constituents are in expected amounts.

Date : September 28, 2016

SAMPLE IDENTIFICATION

Internal code : 16I16-PTH11-1-DM

Customer identification : Palo Santo - PJ010061R

Type : Essential oil

Source : *Bursera graveolens*

Customer : Plant Therapy

ANALYSIS

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

Analyst : Sylvain Mercier, M. Sc., chimiste

Analysis date : 2016-09-26

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.	
3-Methylcyclopentanone	2.33	852	0.08	0.05	1133	2.19	Aliphatic ketone
α -Thujene	3.25	918	0.02	0.03	951	0.88	Monoterpene
α -Pinene	3.35	924	0.23	0.23	944	0.85	Monoterpene
3-Methylcyclohexanone	3.96	961	0.03	0.01	1252	3.66	Aliphatic ketone
Sabinene	4.07	968	0.17	0.18	1054	1.48	Monoterpene
β -Pinene	4.13	971	0.04	0.04	1037	1.35	Monoterpene
Myrcene	4.41	988	0.58	0.42	1114	1.97	Monoterpene
Dehydro-1,8-cineole	4.45	990	0.22	0.16	1126	2.10	Monoterp. ether
Hexahydroacetophenone	4.47	992	0.26	0.27	1236	3.45	Aliphatic ketone
α -Phellandrene	4.68*	1004	0.06	0.03	1108	1.92	Monoterpene
Δ 3-Carene	4.68*	1004	[0.06]	0.02	1087	1.74	Monoterpene
Limonene	5.20*	1033	67.54	67.29	1149	2.38	Monoterpene
para-Cymene	5.20*	1033	[67.54]	0.59	1207	3.04	Monoterpene
1,8-Cineole	5.22	1034	0.15	0.16	1150	2.39	Monoterp. ether
γ -Terpinene	5.65	1058	0.15	0.13	1187	2.82	Monoterpene
para-Cymenene	6.33	1095	0.08	0.08	1366	5.27	Monoterpene
Linalool	6.65	1107	0.08	0.10	1490	7.36	Monoterp. alcohol
trans-para-Mentha-2,8-dien-1-ol	7.15	1126	0.54	0.72	1552	8.86	Monoterp. alcohol
cis-Limonene oxide	7.24	1129	0.06	0.06	1370	5.33	Monoterp. ether
Limona ketone	7.33	1132	0.10	0.07	1470	7.00	Simple phenolic
trans-Limonene oxide	7.36	1133	0.14	0.14	1384	5.51	Monoterp. ether
cis-para-Mentha-2,8-dien-1-ol	7.56	1141	0.44	0.52	1592	10.06	Monoterp. alcohol
cis- β -Terpineol	7.91*	1154	0.39	0.02	1569	9.36	Monoterp. alcohol
Menthone	7.91*	1154	[0.39]	0.25	1388	5.58	Monoterp. ketone
Menthofuran	8.07	1160	3.91	3.94	1407	5.86	Monoterp. ether
Isomenthone	8.15	1163	0.19	0.32	1412	5.93	Monoterp. ketone
trans- β -Terpineol	8.47	1175	0.06	0.17	1616	10.77	Monoterp. alcohol
trans-Isopulegone	8.53	1177	0.06	0.04	1509	7.71	Monoterp. ketone
Limonen-4-ol	8.74*	1185	0.43	0.38	1521	7.95	Monoterp. alcohol
Terpinen-4-ol	8.74*	1185	[0.43]	0.15	1528	8.16	Monoterp. alcohol
trans-para-Mentha-1(7),8-dien-2-ol	9.11	1198	0.06	0.06	1731	15.64	Monoterp. alcohol
α -Terpineol	9.48	1206	9.55	9.82	1628	11.17*	Monoterp. alcohol
trans-Isopiperitenol	9.55	1208	0.63				Monoterp. alcohol
cis-Isopiperitenol	10.14	1221	0.16				Monoterp. alcohol
trans-Carveol	10.48	1229	1.36	1.38	1754	16.99	Monoterp. alcohol
cis-para-Mentha-1(7),8-dien-2-ol	10.60	1231	0.13	0.16	1799	19.59	Monoterp. alcohol
Pulegone	10.83	1237	1.32	1.27	1548	8.76	Monoterp. ketone

<i>cis</i> -Carveol	11.04	1241	0.63	0.82	1780	18.52	Monoterp. alcohol
Carvone	11.28	1247	2.90	3.17	1633	11.40*	Monoterp. ketone
α -Cubebene	15.69	1329	0.01	0.01	1422	6.09	Sesquiterpene
Piperitenone	16.17	1336	0.08	0.08	1789	19.05	Monoterp. ketone
Menthofuro lactone	16.81	1346	0.17				Monoterp. lactone
α -Copaene	17.37	1355	0.03	0.03	1436	6.35	Sesquiterpene
β -Elemene	18.61	1374	0.08	0.08	1532	8.26	Sesquiterpene
β -Barbatene	22.67	1428	0.05				Sesquiterpene
γ -Muurolene	25.06	1456	0.17	0.45	1608	10.56	Sesquiterpene
Germacrene D	25.20	1458	0.11	[9.82]	1628	11.17*	Sesquiterpene
β -Selinene	25.81	1466	0.02	[3.17]	1633	11.40*	Sesquiterpene
α -Selinene	26.46	1472	0.04	[3.17]	1633	11.40*	Sesquiterpene
Mint lactone	28.51	1498	0.92	0.94	2126	37.77	Monoterp. lactone
<i>trans</i> -Calamenene	28.73	1501	0.03	0.03	1724	15.38	Sesquiterpene
δ -Cadinene	28.91	1503	0.10	0.07	1677	13.33	Sesquiterpene
iso-Mint lactone	30.97	1531	0.15	0.13	2174	39.22	Monoterp. lactone
7- α -Hydroxymint lactone	32.76	1556	0.13				Monoterp. alcohol
Spathulenol	33.72	1569	0.13	0.14	2028	34.04	Sesquiterp. alcohol
1,5-Epoxy salvia-4(14)-ene	34.29	1577	0.06				Sesquiterp. ether
Junenol	35.72	1598	0.28	0.25	1927	27.99	Sesquiterp. alcohol
Salvia-4(14)-en-1-one	36.25	1611	0.32				Sesquiterp. ketone
Total identified			95.63%	95.46%			

*: 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 : Light yellow liquid

Refractive index : 1.4760 \pm 0.0003 (20 °C)

CONCLUSION

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



