

Date : September 28, 2017

SAMPLE IDENTIFICATION

Internal code : 17118-PTH8-1-DM

Customer identification : Geranium Bourbon - Madagascar - G2010676R

Type : Essential oil

Source : *Pelargonium x asperum*

Customer : Plant Therapy

ANALYSIS

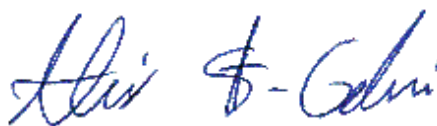
Method : PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

Identifications double-checked by GC-MS

Analyst : Benoit Roger Ph. D.

Analysis date : 2017-09-25

Checked and approved by :



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

Note: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.

This report is digitally signed, it is only considered valid if the digital signature is intact.

IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Isoamyl alcohol	1.16	738	0.01	0.09	1141	3.01*	Aliphatic alcohol
3-Methylpentanol	2.37	855	0.03	0.03	1270	4.79	Aliphatic alcohol
cis-Hex-3-en-1-ol	2.50	865	0.02	0.04	1321	5.60	Aliphatic alcohol
trans-Hex-2-en-1-ol	2.64	876	0.01	0.02	1344	5.95	Aliphatic alcohol
α-Pinene	3.41	926	0.54	0.52	938	1.19	Monoterpene
Geranic oxide	4.08	966	0.03				Monoterp. ether
β-Pinene	4.20	972	0.01				Monoterpene
Myrcene	4.47	989	0.16	0.15	1111	2.62	Monoterpene
trans-Dehydroxylinalool oxide	4.52	991	0.03	0.04	1147	3.08	Monoterp. ether
6-Methyl-5-hepten-2-one	4.55	993	0.06	0.05	1275	4.88	Aliphatic ketone
α-Phellandrene	4.75	1005	0.07	0.04	1105	2.54	Monoterpene
para-Cymene	5.13	1025	0.06	0.08	1202	3.79*	Monoterpene
Limonene	5.16	1027	0.12	0.10	1137	2.95	Monoterpene
β-Phellandrene	5.20	1029	0.05	[0.09]	1141	3.01*	Monoterpene
1,8-Cineole	5.23	1031	0.02	[0.09]	1141	3.01*	Monoterp. ether
cis-β-Ocimene	5.35	1037	0.11	0.15	1182	3.57*	Monoterpene
trans-β-Ocimene	5.53	1047	0.10	[0.08]	1202	3.79*	Monoterpene
γ-Terpinene	5.72	1057	0.02	[0.15]	1182	3.57*	Monoterpene
cis-Linalool oxide (fur.)	6.00	1072	0.12	0.09	1374	6.42	Monoterp. alcohol
Terpinolene	6.20	1083	0.02	0.02	1223	4.10	Monoterpene
trans-Linalool oxide (fur.)	6.32	1090	0.05	0.06	1403	6.98*	Monoterp. alcohol
Linalool	6.76	1109	10.26	10.39	1495	9.18*	Monoterp. alcohol
cis-Rose oxide	6.81	1110	0.94	0.94	1293	5.14	Monoterp. ether
trans-Rose oxide	7.16	1123	0.37	0.39	1304	5.32	Monoterp. ether
Isopulegol	7.83	1147	0.07	[10.39]	1495	9.18*	Monoterp. alcohol
Citronellal	7.98	1153	0.05	5.42	1408	7.10*	Monoterp. aldehyde
Menthone	8.03	1155	0.87	0.83	1386	6.62	Monoterp. ketone
Isomenthone	8.32	1165	5.18	[5.42]	1408	7.10*	Monoterp. ketone
Terpinen-4-ol	8.84	1184	0.01	0.67	1519	10.07*	Monoterp. alcohol
Isomenthol	9.13	1194	0.09	10.20	1556	11.44*	Monoterp. alcohol
α-Terpineol	9.48	1203	0.39	1.47	1616	14.01*	Monoterp. alcohol
Nerol	10.61	1228	0.59	0.60	1724	20.09	Monoterp. alcohol
Citronellol	11.14	1240	23.95	24.57	1708	18.98	Monoterp. alcohol
Neral	11.21	1242	0.38	0.36	1595	12.90	Monoterp. aldehyde
Geraniol	12.23	1264	16.89	17.50	1779	23.76	Monoterp. alcohol
trans-Myrtanol	12.36	1267	0.11	0.15	1763	22.73*	Monoterp. alcohol
Geranial	12.55	1271	0.13	0.54	1642	15.36	Monoterp. aldehyde
Citronellyl formate	12.86	1278	10.26	[10.20]	1556	11.44*	Monoterp. ester
Neryl formate	12.91	1279	0.20				Monoterp. ester
Geranyl formate	14.18	1304	5.89	5.82	1633	14.90*	Monoterp. ester

α -Cubebene	16.00	1331	0.06	[0.06]	1403	6.98*	Sesquiterpene
Citronellyl acetate	17.27*	1351	0.24	0.58	1601	13.18	Monoterp. ester
Citronellic acid	17.27*	1351	[0.24]	0.06	2171	42.20	Monoterp. acid
α -Copaene	17.72	1357	0.28	0.30	1428	7.55	Sesquiterpene
β -Bourbonene	18.15	1364	0.80	0.78	1449	8.07	Sesquiterpene
β -Cubebene	18.68	1372	0.03	0.02	1481	8.85	Sesquiterpene
β -Elemene	18.94	1376	0.08	[0.67]	1519	10.07*	Sesquiterpene
Geranyl acetate	19.39	1383	0.39	0.30	1687	17.79	Monoterp. ester
Geranic acid	19.67	1387	0.02	0.11	2249	44.10	Monoterp. acid
β -Caryophyllene	20.62	1401	1.15	1.09	1517	9.97	Sesquiterpene
Aromadendrene	22.12	1418	0.52	5.28	1535	10.66*	Sesquiterpene
6,9-Guaiadiene	22.70	1425	5.35	[5.28]	1535	10.66*	Sesquiterpene
<i>cis</i> - β -Farnesene	23.08	1430	0.36	0.34	1579	12.33*	Sesquiterpene
Seychellene	23.42	1434	0.23	0.31	1544	10.99	Sesquiterpene
α -Humulene	23.67	1437	0.11	[0.34]	1579	12.33*	Sesquiterpene
allo-Aromadendrene	24.03	1441	0.39	[10.20]	1556	11.44*	Sesquiterpene
Citronellyl propionate	24.41	1446	0.04				Monoterp. ester
γ -Muuroleone	25.08	1454	0.16	0.16	1607	13.51	Sesquiterpene
Germacrene D	25.64	1460	0.87	[1.47]	1616	14.01*	Sesquiterpene
β -Selinene	26.24	1467	0.23	[1.47]	1616	14.01*	Sesquiterpene
Viridiflorene	26.44	1470	0.18	[1.47]	1616	14.01*	Sesquiterpene
Geranyl propionate	26.67	1473	0.90	1.20	1750	21.84	Monoterp. ester
Bicyclogermacrene	26.88	1475	0.05	[5.82]	1633	14.90*	Sesquiterpene
α -Muuroleone	27.66	1484	0.08	[5.82]	1633	14.90*	Sesquiterpene
δ -Guaiene	27.80	1486	0.16	[5.82]	1633	14.90*	Sesquiterpene
γ -Cadinene	28.71	1497	0.12	0.12	1657	16.18	Sesquiterpene
δ -Cadinene	29.36	1506	0.42	0.51	1670	16.84*	Sesquiterpene
Zonarene	29.54	1508	0.07	0.70	1663	16.48	Sesquiterpene
<i>trans</i> -Calamenene	29.74	1511	0.08	0.08	1730	20.47	Sesquiterpene
<i>trans</i> - γ -Bisabolene	29.90	1513	0.23	[0.51]	1670	16.84*	Sesquiterpene
Furopolargone A	30.50	1522	0.08				Sesquiterp. ketone
α -Agarofuran	31.04	1529	0.08	[0.15]	1763	22.73*	Sesquiterp. ether
Citronellyl butyrate	31.45	1535	0.53	0.52	1736	20.91	Monoterp. ester
Neryl butyrate	32.12	1545	0.11				Monoterp. ester
Geranyl butyrate	33.78*	1568	1.03	0.88	1825	27.02	Monoterp. ester
Caryophyllene oxide	33.78*	1568	[1.03]	0.14	1840	28.12	Sesquiterp. ether
Furopolargone B	34.46	1578	0.52	0.66	1975	36.02*	Sesquiterp. ketone
Phenylethyl tiglate	35.25	1589	0.47	0.53	2071	39.41*	Phenolic ester
Geranyl isovalerate	35.87	1597	0.32	0.41	1830	27.41	Monoterp. ester
10- <i>epi</i> - γ -Eudesmol	36.05	1601	0.13	[0.66]	1975	36.02*	Sesquiterp. alcohol
1,10- <i>diepi</i> -Cubenol	36.29	1607	0.05	0.32	1946	34.70*	Sesquiterp. alcohol
1- <i>epi</i> -Cubenol	36.64	1616	0.07	[0.66]	1975	36.02*	Sesquiterp. alcohol
γ -Eudesmol	37.03	1625	0.05	[0.53]	2071	39.41*	Sesquiterp. alcohol
Cubenol	37.25	1631	0.06	[0.32]	1946	34.70*	Sesquiterp. alcohol

τ-Muurolol	37.65	1641	0.03	0.08	2077	39.61	Sesquiterp. alcohol
α-Cadinol	38.09	1651	0.09	0.09	2117	40.79	Sesquiterp. alcohol
Citronellyl tiglate	38.70	1666	0.33	0.34	1933	34.08	Monoterp. ester
Geranyl tiglate	40.05	1700	1.39	1.51	2028	38.08	Monoterp. ester
Geranyl caproate isomer	40.59	1717	0.14				Monoterp. ester
Geranyl caproate	41.74	1753	0.06	0.04	2019	37.78	Monoterp. ester
Geranyl caprylate	47.12	1947	0.04	0.08	2217	43.39	Monoterp. ester
Total identified			97.45%	98.87%			

*: 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 green liquid

Refractive index : 1.4640 ± 0.0003 (20 °C)

CONCLUSION

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

17118-PTH8-1-DM_BPS

