

GC-MS Profiling Analysis Prepared for Jade Bloom, Inc

Date: January 30, 2018
Sample: Organic Geranium Oil
Type: Essential Oil
Source: *Pelargonium graveolens*
Batch: #Lot D1610A835

IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Isoamyl alcohol	1.15	737	0.01	0.02	1158	2.76	Aliphatic alcohol
Dimethyl sulfoxide	1.87	817	0.02				Sulphurous
3-Methylpentanol	2.37	855	0.05	0.10	1278	4.40*	Aliphatic alcohol
cis-Hex-3-en-1-ol	2.50	865	0.01	0.02	1325	5.08	Aliphatic alcohol
α -Pinene	3.41	926	0.51	0.50	942	1.00	Monoterpene
Geranic oxide	4.08	965	0.05	0.05	1053	1.66	Monoterp. ether
β -Pinene	4.20	972	0.01	0.01	1040	1.56	Monoterpene
Myrcene	4.47	988	0.11	0.09	1116	2.24	Monoterpene
trans-Dehydroxylinalool oxide	4.49	990	0.03	0.04	1155	2.72	Monoterp. ether
6-Methyl-5-hepten-2-one	4.52	991	0.04	[0.10]	1278	4.40*	Aliphatic ketone
α -Phellandrene	4.75	1004	0.08	0.06	1109	2.16	Monoterpene
Δ^3 -Carene	4.78	1006	0.03	0.03	1094	1.98	Monoterpene
para-Cymene	5.14	1025	0.08	0.10	1207	3.40	Monoterpene
Limonene	5.17	1027	0.16	0.16	1140	2.53	Monoterpene
β -Phellandrene	5.20	1028	0.06	0.07	1146	2.61*	Monoterpene
1,8-Cineole	5.23	1030	0.01	[0.07]	1146	2.61*	Monoterp. ether
cis- β -Ocimene	5.35	1037	0.08	0.11	1184	3.11*	Monoterpene
trans- β -Ocimene	5.53	1046	0.12	0.10	1201	3.30	Monoterpene
γ -Terpinene	5.72	1057	0.05	[0.11]	1184	3.11*	Monoterpene
cis-Linalool oxide (fur.)	6.00	1072	0.23	0.20	1383	5.93	Monoterp. alcohol
Terpinolene	6.20	1083	0.05	0.03	1220	3.59	Monoterpene
trans-Linalool oxide (fur.)	6.32	1089	0.11	0.10	1410	6.38	Monoterp. alcohol
para-Cymenene	6.42	1095	0.01	0.02	1361	5.60	Monoterpene
6,7-Epoxygeranyl	6.47	1097	0.01	0.01	1344	5.34	Monoterp. ether
Linalool	6.74	1107	4.13	4.33	1503	8.26*	Monoterp. alcohol
cis-Rose oxide	6.80	1109	1.12	1.10	1295	4.64	Monoterp. ether
trans-Rose oxide	7.15	1122	0.46	0.45	1307	4.80	Monoterp. ether
Isopulegol	7.83	1147	0.12	[4.33]	1503	8.26*	Monoterp. alcohol
Citronellal	7.98	1152	0.14	0.15	1416	6.50	Monoterp. aldehyde
Menthone	8.03	1154	1.02	0.93	1389	6.03	Monoterp. ketone
Isomenthone	8.33	1165	5.93	5.86	1414	6.46	Monoterp. ketone
Menthol	8.88	1184	0.04	0.03	1583	10.80	Monoterp. alcohol
Isomenthol	9.15	1194	0.16	7.40	1561	10.06*	Monoterp. alcohol
α -Terpineol	9.50	1204	0.30	0.18	1622	12.26	Monoterp. alcohol
Nerol	10.63	1228	0.34	0.23	1734	17.84*	Monoterp. alcohol
Citronellol	11.24*	1241	33.93	34.01	1721	17.09	Monoterp. alcohol
Neral	11.24*	1241	[33.93]	0.65	1605	11.48	Monoterp. aldehyde
Geraniol	12.24	1263	13.44	13.53	1793	21.46	Monoterp. alcohol
Citronellyl formate	12.84*	1276	7.80	[7.40]	1561	10.06*	Monoterp. ester
Geranial	12.84*	1276	[7.80]	0.71	1652	13.63	Monoterp. aldehyde

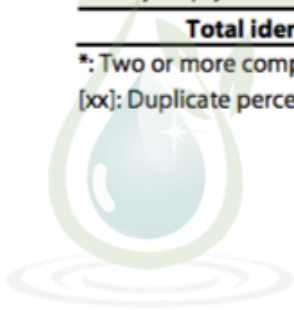
Geranyl formate	14.14	1303	2.61	2.98	1638	13.03*	Monoterp. ester
α -Cubebene	15.99	1331	0.19	0.21	1404	6.27	Sesquiterpene
Citronellic acid	17.16	1348	0.07	0.04	2173	40.54	Monoterp. acid
Citronellyl acetate	17.26	1350	0.32	0.30	1606	11.54	Monoterp. ester
α -Copaene	17.73	1357	0.51	0.49	1425	6.69	Sesquiterpene
β -Bourbonene	18.17	1363	1.04	1.03	1447	7.12	Sesquiterpene
β -Cubebene	18.69	1371	0.07	0.03	1471	7.59	Sesquiterpene
β -Elemene	18.95	1375	0.05	0.06	1524	8.93	Sesquiterpene
Geranyl acetate	19.38	1381	0.43	0.40	1693	15.59	Monoterp. ester
Geranic acid	19.68	1386	0.16	0.15	2269	42.96	Monoterp. acid
β -Caryophyllene	20.65	1400	1.25	1.24	1517	8.69	Sesquiterpene
β -Copaene	21.55	1411	0.13	0.13	1519	8.77	Sesquiterpene
Aromadendrene	22.03	1416	0.06	0.10	1530	9.11	Sesquiterpene
6,9-Guaiadiene	22.60	1423	0.42	0.32	1532	9.19	Sesquiterpene
Seychellene	23.08*	1429	0.54	0.39	1542	9.50	Sesquiterpene
<i>cis</i> - β -Farnesene	23.08*	1429	[0.54]	0.48	1579	10.66*	Sesquiterpene
α -Humulene	23.44	1433	0.29	[0.48]	1579	10.66*	Sesquiterpene
allo-Aromadendrene	23.69	1436	0.20	[7.40]	1561	10.06*	Sesquiterpene
Citronellyl propionate	24.02	1440	0.35				Monoterp. ester
Neryl propionate	25.09	1453	0.32	[0.23]	1734	17.84*	Monoterp. ester
γ -Murolene	25.69*	1460	1.67	0.14	1608	11.62	Sesquiterpene
Germacrene D	25.69*	1460	[1.67]	1.73	1618	12.09	Sesquiterpene
β -Selinene	26.28	1467	0.13	0.13	1625	12.40	Sesquiterpene
Viridiflorene	26.48	1469	0.27	0.18	1612	11.79	Sesquiterpene
Geranyl propionate	26.65	1471	0.72	0.69	1756	19.19	Monoterp. ester
Bicyclogermacrene	26.91*	1474	0.45	[2.98]	1638	13.03*	Sesquiterpene
α -Selinene	26.91*	1474	[0.45]	0.43	1628	12.55	Sesquiterpene
4- <i>epi-cis</i> -Dihydroagarofuran	27.30	1479	0.09				Sesquiterp. ether
α -Murolene	27.69	1484	0.18	0.18	1641	13.18	Sesquiterpene
β -Dihydroagarofuran	27.82	1485	0.07				Sesquiterp. ether
<i>cis</i> -Dihydroagarofuran	28.04	1488	0.07				Sesquiterp. ether
γ -Cadinene	28.75	1496	0.26	0.42	1664	14.22	Sesquiterpene
(<i>E,E</i>)- α -Farnesene	29.13	1501	0.09	0.10	1691	15.47	Sesquiterpene
δ -Cadinene	29.42	1505	0.92	0.96	1671	14.53	Sesquiterpene
Zonarene	29.59	1508	0.15	0.33	1667	14.33	Sesquiterpene
<i>trans</i> -Calamenene	29.80	1511	0.31	0.34	1736	18.01	Sesquiterpene
<i>trans</i> - γ -Bisabolene	30.31	1518	0.10	0.11	1678	14.88	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	30.53	1521	0.14	0.12	1688	15.32	Sesquiterpene
α -Agarofuran	31.26	1532	0.24	0.23	1764	19.63	Sesquiterp. ether
Citronellyl butyrate	31.44	1534	0.55	0.49	1741	18.29	Monoterp. ester
Caryophyllene oxide	33.78*	1567	1.18	0.11	1846	25.04	Sesquiterp. ether
Geranyl butyrate	33.78*	1567	[1.18]	1.02	1830	23.92	Monoterp. ester
Spathulenol	34.06	1571	0.19	0.18	2021	35.76*	Sesquiterp. alcohol

Europolargone B	34.41	1576	0.10	4.64	1986	33.95*	Sesquiterp. ketone
Phenylethyl tiglate	35.31	1589	0.79	0.76	2082	37.85	Phenolic ester
Geranyl isovalerate	35.90	1597	0.09	0.16	1834	24.22	Monoterp. ester
10-epi- γ -Eudesmol	36.25	1605	4.56	[4.64]	1986	33.95*	Sesquiterp. alcohol
1,10-diepi-Cubenol	36.56	1613	0.01	0.07	1949	31.83	Sesquiterp. alcohol
1-epi-Cubenol	36.68	1616	0.11	0.12	1960	32.44	Sesquiterp. alcohol
Cubenol	37.03	1624	0.22	0.18	1957	32.28	Sesquiterp. alcohol
Hinesol	37.14	1627	0.22	0.25	2108	38.75	Sesquiterp. alcohol
τ -Cadinol	37.59	1638	0.23	0.21	2075	37.60	Sesquiterp. alcohol
τ -Muurolol	37.70	1641	0.05	0.04	2089	38.11	Sesquiterp. alcohol
β -Eudesmol	37.92*	1646	0.65	0.24	2113	38.91	Sesquiterp. alcohol
α -Muurolol	37.92*	1646	[0.65]	0.24	2102	38.56	Sesquiterp. alcohol
α -Cadinol	38.15	1652	0.13	0.22	2125	39.24	Sesquiterp. alcohol
Geranyl valerate	38.39	1658	0.17	0.18	1930	30.73	Monoterp. ester
Citronellyl tiglate	38.71	1666	0.33	0.31	1940	31.31	Monoterp. ester
Geranyl tiglate	40.05	1699	1.17	1.21	2036	36.26	Monoterp. ester
Geranyl caproate isomer	40.58	1716	0.20	[0.18]	2021	35.76*	Monoterp. ester
Geranyl caproate	41.74	1752	0.10	0.08	2025	35.90	Monoterp. ester
Geranyl caprylate	47.11	1946	0.04	0.04	2226	41.94	Monoterp. ester
Total identified			96.81%	96.57%			

*: 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



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OTHER DATA

Physical aspect : Light yellow liquid

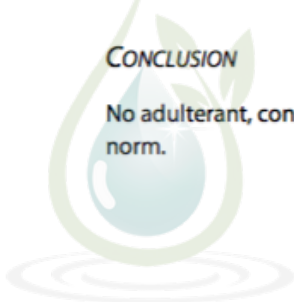
Refractive index : 1.4670 \pm 0.0003 (20 °C)

COMPLIANCE WITH ISO 4731:2011 (PELARGONIUM X, NORTH AFRICAN TYPE)

Compound	North Africa		Observed %	Complies?
	Min. %	Max. %		
<i>cis</i> -Rose oxide	0.7	1.5	1.2	Yes
<i>trans</i> -Rose oxide	0.3	0.6	0.5	Yes
Menthone		2.1	1.0	Yes
Isomenthone	4.0	8.0	5.9	Yes
Linalool	4.0	8.5	4.1	Yes
6,9-Guaiadiene		0.5	0.4	Yes
Citronellyl formate	4.0	8.0	7.4	Yes
α -Terpineol	0.3	0.6	0.3	Yes
Geranyl formate	2.0	7.0	2.6	Yes
Citronellol	25.0	36.0	33.9	Yes
Geraniol	10.0	18.0	13.4	Yes
Geranyl butyrate	0.7	2.0	1.0	Yes
10-epi- γ -Eudesmol	3.0	6.2	4.6	Yes
Geranyl tiglate	0.9	2.0	1.2	Yes
Phenylethyl tiglate	0.5	1.2	0.8	Yes
Refractive index	1.461	1.475	1.4670	Yes

CONCLUSION

No adulterant, contaminant or diluent were detected using this method. The oil complies with the ISO norm.



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