

GC/MS BATCH NUMBER: B30102

ESSENTIAL OIL: BERGAMOT
BOTANICAL NAME: CITRUS AURANTIUM
ORIGIN: ITALY

KEY CONSTITUENTS PRESENT IN THIS BATCH OF BERGAMOT OIL	%
LIMONENE	38.5
LINALYL ACETATE	29.6
LINALOOL	11.8
β-PINENE	7.1
γ-TERPINENE	6.3
α-PINENE	1.0
SABINENE	1.0
MYRCENE	1.0
GERANIAL	0.3
β-BISABOLENE	0.01

Comments from Robert Tisserand: Has the refined, Earl-Grey tea scent characteristic of Bergamot oil. Conforms to the 7 key ISO constituents for regular Bergamot oil, except that b-bisabolene is low, which is common in bergapten-less Bergamot oil such as this one.

Date : April 12, 2016

SAMPLE IDENTIFICATION

Internal code : 16D07-PTH1-1-DM

Customer identification : Bergamot BF (Bergapten Free) - Italy - B3010261R

Type : Essential oil

Source : *Citrus aurantium ssp. bergamia*

Customer : Plant Therapy

ANALYSIS

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

Analyst : Alexis St-Gelais, M. Sc., chimiste

Analysis date : 2016-04-08

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.	
α -Thujene	3.08	921	0.22	1.23	960	0.94†	Monoterpene
α -Pinene	3.18	927	1.03	[1.23]	951	0.91†	Monoterpene
Camphene	3.46	944	0.04	0.04	1006	1.14	Monoterpene
Sabinene	3.88	970	1.03	1.07	1062	1.59	Monoterpene
β -Pinene	3.95	974	7.13	7.11	1046	1.46	Monoterpene
Myrcene	4.22	990	1.00	0.95	1119	2.09	Monoterpene
α -Phellandrene	4.48*	1006	0.02	0.02	1112	2.01	Monoterpene
Δ 3-Carene	4.48*	1006	[0.02]	tr	1094	1.84	Monoterpene
Octanal	4.61	1013	0.02	0.01	1237	3.54	Aliphatic aldehyde
α -Terpinene	4.67	1017	0.10	0.11	1126	2.16	Monoterpene
Limonene	4.96*	1033	39.29	38.45	1151	2.46	Monoterpene
para-Cymene	4.96*	1033	[39.29]	0.57	1214	3.20	Monoterpene
1,8-Cineole	4.96*	1033	[39.29]	0.38	1153	2.48	Monoterp. ether
<i>cis</i> - β -Ocimene	5.08	1040	0.03	6.29	1196	2.98*	Monoterpene
<i>trans</i> - β -Ocimene	5.26	1050	0.10	0.08	1209	3.13	Monoterpene
γ -Terpinene	5.45	1061	6.30	[6.29]	1196	2.98*	Monoterpene
<i>cis</i> -Linalool oxide (fur.)	5.71	1075	0.02	0.03	1388	5.66	Monoterp. alcohol
Terpinolene	5.90	1086	0.12	0.11	1228	3.40	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	6.01	1092	0.05	0.05	1414	6.07	Monoterp. alcohol
Linalool	6.37	1109	11.76	41.88	1508	7.85†	Monoterp. alcohol
Nonanal	6.43	1111	0.04	0.01	1344	5.02	Aliphatic aldehyde
endo-Fenchol	6.69	1122	0.01	0.01	1529	8.40	Monoterp. alcohol
<i>cis</i> -Limonene oxide	6.95	1132	0.01	0.01	1379	5.55	Monoterp. ether
<i>trans</i> -Limonene oxide	7.05	1136	0.01	0.01	1393	5.74	Monoterp. ether
Terpinen-4-ol	8.20	1181	0.03	0.02	1537	8.64	Monoterp. alcohol
α -Terpineol	8.77	1203	0.10	0.09	1632	11.78	Monoterp. alcohol
Octyl acetate	9.34	1216	0.10	0.08	1430	6.36	Aliphatic ester
Nerol	9.91	1230	0.01	0.02	1737	16.77	Monoterp. alcohol
Neral	10.42	1242	0.19	0.16	1607	10.80	Monoterp. aldehyde
Linalyl acetate	10.89	1253	29.64	[41.88]	1516	8.04†	Monoterp. ester
Geraniol	11.25	1261	0.10	0.01	1790	19.87	Monoterp. alcohol
Geranial	11.78	1274	0.31	0.20	1655	12.79	Monoterp. aldehyde
Neryl acetate	16.73	1363	0.38	0.34	1665	13.22*	Monoterp. ester
β -Elemene	18.14*	1386	0.39	0.10	1526	8.32	Sesquiterpene
Geranyl acetate	18.14*	1386	[0.39]	0.29	1696	14.66	Monoterp. ester
β -Caryophyllene	19.25	1403	0.12	0.12	1520	8.12	Sesquiterpene
<i>trans</i> - α -Bergamotene	20.80	1422	0.02	0.02	1533	8.53	Sesquiterpene

β -Bisabolene	27.03	1498	0.01	[0.34]	1665	13.22*	Sesquiterpene
Total identified	99.73%		99.87%				

*: Two or more compounds are coeluting on this column

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

†: Peaks apexes were resolved, but peaks overlapped and were summed for analysis

Note: no correction factor was applied

OTHER DATA

Physical aspect : Light yellow liquid

Refractive index : 1.4620 ± 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent were detected using this method. No coumarin (including bergapten) has been detected.



