



GC/MS BATCH NUMBER: G50104

ESSENTIAL OIL: GRAPEFRUIT
BOTANICAL NAME: CITRUS X PARADISI
ORIGIN: USA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF GRAPEFRUIT OIL	%
Limonene	92.31
Myrcene	1.88

Comments from Robert Tisserand: Excellent fresh, green-citrus odor quality. All ten key constituents meet the ISO standard.

Date : February 23, 2017

SAMPLE IDENTIFICATION

Internal code : 17B06-PTH8-1-DM

Customer identification : Grapefruit - USA - G50104611R

Type : Essential oil

Source : *Citrus x paradisi*

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 : 2017-02-21

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	3.29	921	0.01	0.01	956	1.24	Monoterpene
α -Pinene	3.39	927	0.53	0.52	946	1.19	Monoterpene
Sabinene	4.10	970	0.47	0.46	1056	2.03	Monoterpene
β -Pinene	4.17	973	0.09	0.09	1038	1.86	Monoterpene
Myrcene	4.45	990	1.88	1.87	1114	2.63	Monoterpene
α -Phellandrene	4.72	1006	0.03	0.02	1108	2.53	Monoterpene
Octanal	4.82	1011	0.40	0.38	1229	4.22	Aliphatic aldehyde
Limonene	5.26*	1035	90.97	92.31	1151	3.12	Monoterpene
1,8-Cineole	5.26*	1035	[90.97]	0.29	1152	3.13	Monoterp. ether
para-Cymene	5.26*	1035	[90.97]	0.02	1206	3.87	Monoterpene
cis- β -Ocimene	5.32	1039	0.01	0.05	1187	3.59*	Monoterpene
trans- β -Ocimene	5.49	1048	0.11	0.11	1199	3.77	Monoterpene
γ -Terpinene	5.68	1058	0.04	[0.05]	1187	3.59*	Monoterpene
Terpinolene	6.03	1077	0.01	0.01	1220	4.08	Monoterpene
Octanol	6.09	1081	0.04	0.03	1499	9.39	Aliphatic alcohol
Linalool	6.56	1104	0.09	0.09	1490	9.13	Monoterp. alcohol
Nonanal	6.71	1110	0.08	0.07	1330	5.77	Aliphatic aldehyde
cis-Limonene oxide	7.26	1130	0.01	0.01	1379	6.57	Monoterp. ether
trans-Limonene oxide	7.38	1134	0.01	0.01	1401	6.96	Monoterp. ether
Citronellal	7.87	1152	0.07	0.06	1410	7.17	Monoterp. aldehyde
α -Terpineol	9.20	1200	0.04	0.05	1616	14.12	Monoterp. alcohol
Decanal	9.65	1211	0.30	0.27	1429	7.66	Aliphatic aldehyde
Neral	10.97	1240	0.04	0.04	1605	13.52	Monoterp. aldehyde
Geranial	12.43	1272	0.06	0.06	1639	15.38	Monoterp. aldehyde
α -Copaene	17.45	1357	0.09	0.10	1421	7.45	Sesquiterpene
β -Cubebene	18.43	1372	0.08	0.07	1464	8.52	Sesquiterpene
Geranyl acetate	19.08	1382	0.04	0.04	1681	17.65	Monoterp. ester
β -Caryophyllene	20.26	1400	0.24	0.24	1509	9.78	Sesquiterpene
α -Humulene	23.00	1433	0.03	0.04	1593	12.96	Sesquiterpene
Germacrene D	25.18	1459	0.07	0.07	1609	13.76	Sesquiterpene
δ -Cadinene	28.85	1504	0.09	0.08	1661	16.54	Sesquiterpene
β -Sinensal	39.49	1691	0.05	0.05	2112	40.77	Sesquiterp. aldehyde
Nootkatone	42.63	1788	0.14	0.15	2333	46.14	Sesquiterp. ketone
Isomeranzin	53.40	2231	0.30	0.19	3622	68.02	Coumarin
Auraptene	60.87	2614	0.91	0.59	3701	69.11	Coumarin
Tangeretin	69.67	3147	0.17				Flavonoid
Hexamethoxyflavone isomer?	72.44	3322	0.34				Flavonoid

Heptamethoxyflavone isomer?	72.64	3333	0.17		Flavonoid
Total identified			98.01%	98.45%	

*: 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 : Orange liquid

Refractive index : 1.4735 ± 0.0003 (20 °C)

CONCLUSION

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

