

## GC/MS BATCH NUMBER: O20102

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**ESSENTIAL OIL:** SWEET ORANGE  
**BOTANICAL NAME:** CITRUS SINENSIS  
**ORIGIN:** BRAZIL

KEY CONSTITUENTS PRESENT IN THIS BATCH OF SWEET ORANGE OIL	%
LIMONENE	94.8
MYRCENE	1.8
$\alpha$ -PINENE	0.5
LINALOOL	0.4
SABINENE	0.3
OCTANAL	0.2
GERANIAL	0.1
NONANAL	0.1
NERAL	0.1
$\beta$ -PINENE	0.02
NOOTKATONE	0.01
VALENCENE	0.01

Comments from Robert Tisserand: A mouth-watering orange oil which conforms to the ISO standard on all 12 key constituents.

Date : January 4, 2016

*SAMPLE IDENTIFICATION*

**Internal code :** 15L14-PTH2-1-LC

**Customer identification :** Sweet Orange - Brazil - O2010251

**Type :** Essential oil

**Source :** *Citrus sinensis*

**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 :** 2016-01-03

*IDENTIFIED COMPOUNDS*

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
α-Thujene	2.68	915	tr	tr	958	1.03	Monoterpene
α-Pinene	2.76	920	0.50	0.52	947	0.98	Monoterpene
Sabinene	3.44	964	0.32	0.34	1063	1.74	Monoterpene
β-Pinene	3.48	967	0.02	0.02	1043	1.57	Monoterpene
Myrcene	3.79	987	1.80	1.84	1122	2.31	Monoterpene
Δ3-Carene	4.02*	1002	0.16	0.14	1095	2.01	Monoterpene
α-Phellandrene	4.02*	1002	[0.16]	0.04	1112	2.19	Monoterpene
Octanal	4.15	1010	0.24	0.23	1243	3.86	Aliphatic aldehyde
Limonene	4.56*	1034	95.47	94.76	1156	2.72	Monoterpene
1,8-Cineole	4.56*	1034	[95.47]	0.27	1157	2.74	Monoterp. ether
Terpinolene	5.41	1083	0.02	0.02	1228	3.64	Monoterpene
Linalool	5.87	1108	0.38	0.40	1510	8.49	Monoterp. alcohol
Nonanal	5.93	1110	0.06	0.04	1348	5.37	Monoterp. aldehyde
cis-Limonene oxide	6.33	1129	0.02	0.02	1384	5.90	Monoterp. ether
trans-Limonene oxide	6.43	1133	0.02	0.02	1396	6.08	Monoterp. ether
Citronellal	6.84	1153	0.05	0.04	1426	6.66	Monoterp. aldehyde
α-Terpineol	7.98	1203	0.04	0.05	1634	12.93	Monoterp. alcohol
Decanal	8.26	1211	0.24	0.19	1446	7.06	Aliphatic aldehyde
Neral	9.33	1240	0.05	0.06	1611	11.84	Monoterp. aldehyde
Geranial	10.56	1273	0.09	0.09	1658	14.06	Monoterp. aldehyde
Undecanal	12.22	1312	0.01				Aliphatic aldehyde
α-Copaene	14.61	1354	0.02	0.02	1428	6.71	Sesquiterpene
β-Cubebene	15.47	1369	0.02	0.02	1476	7.67	Sesquiterpene
β-Caryophyllene	17.04	1397	0.02	0.02	1518	8.73	Sesquiterpene
Dodecanal	18.23	1413	0.04	0.02	1650	13.67	Aliphatic aldehyde
Germacrene D	21.48	1456	0.02	0.03	1618	12.20	Sesquiterpene
Valencene	23.45	1482	0.01	0.01	1661	14.20	Sesquiterpene
β-Sinensal	37.64	1691	0.03				Sesquiterp. aldehyde
α-Sinensal	39.76	1750	0.02	0.02	2233	42.38	Sesquiterp. aldehyde
Nootkatone	40.99	1786	0.01	0.01	2372	45.55	Sesquiterp. ketone
<b>Total identified</b>			<b>99.68%</b>	<b>99.24%</b>			

\*: 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** : Bright yellow liquid

**Refractive index** : 1.4728 ± 0.0003 (20 °C)

### *CONCLUSION*

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

Checked and approved by :

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

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