



## GC/MS BATCH NUMBER: O20105

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**ESSENTIAL OIL:** ORANGE SWEET  
**BOTANICAL NAME:** CITRUS SINENSIS  
**ORIGIN:** SOUTH AMERICA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF ORANGE SWEET OIL	%
1,8-CINEOLE + LIMONENE	94.9
MYRCENE	1.9

Comments from Robert Tisserand: Delightful sweet, zesty odor quality. All thirteen key ISO constituents are within range.

**Date :** October 3, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17126-PTH1-1-CC

**Customer identification :** Sweet Orange - S. America - O2010573

**Type :** Essential oil

**Source :** *Citrus sinensis*

**Customer :** Plant Therapy

*ANALYSIS*

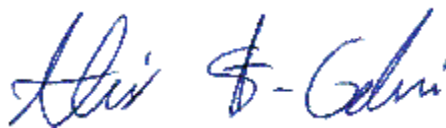
**Method :** PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

Identifications double-checked by GC-MS

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

**Analysis date :** 2017-09-26

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.	
$\alpha$ -Pinene	3.40	926	0.51	0.51	935	1.18	Monoterpene
Sabinene	4.13	968	0.28	0.26	1053	2.02	Monoterpene
$\beta$ -Pinene	4.19	972	0.02	0.02	1033	1.84	Monoterpene
Myrcene	4.47	989	1.88	1.87	1111	2.62	Monoterpene
$\alpha$ -Phellandrene	4.75*	1004	0.14	0.02	1105	2.54	Monoterpene
$\Delta^3$ -Carene	4.75*	1004	[0.14]	0.09	1088	2.33	Monoterpene
Octanal	4.86	1011	0.28	0.28	1229	4.20	Aliphatic aldehyde
1,8-Cineole	5.29*	1034	94.92	94.69	1149	3.12*	Monoterp. ether
Limonene	5.29*	1034	[94.92]	[94.69]	1149	3.12*	Monoterpene
<i>cis</i> - $\beta$ -Ocimene	5.36	1038	0.01	0.01	1182	3.58*	Monoterpene
<i>trans</i> - $\beta$ -Ocimene	5.53	1047	0.02	0.02	1201	3.77	Monoterpene
$\gamma$ -Terpinene	5.72	1057	tr	[0.01]	1182	3.58*	Monoterpene
<i>cis</i> -Sabinene hydrate	6.05	1075	0.01	0.01	1399	6.88	Monoterp. alcohol
Terpinolene	6.19*	1083	0.05	0.01	1222	4.09	Monoterpene
Octanol	6.19*	1083	[0.05]	0.04	1498	9.31	Aliphatic alcohol
Linalool	6.68	1106	0.42	0.43	1491	9.08	Monoterp. alcohol
Nonanal	6.78	1109	0.05	0.04	1333	5.77	Aliphatic aldehyde
<i>cis</i> -Limonene oxide	7.34	1130	0.01	0.01	1368	6.34	Monoterp. ether
<i>trans</i> -Limonene oxide	7.46	1134	0.02	0.01	1381	6.55	Monoterp. ether
Citronellal	7.96	1152	0.05	0.05	1411	7.17	Monoterp. aldehyde
$\alpha$ -Terpineol	9.45	1203	0.05	0.09	1615	13.93*	Monoterp. alcohol
Decanal	9.79	1210	0.24	0.24	1433	7.67	Aliphatic aldehyde
Neral	11.15	1240	0.05	0.06	1593	12.83	Monoterp. aldehyde
Geranial	12.67	1274	0.09	0.13	1639	15.24*	Monoterp. aldehyde
$\alpha$ -Copaene	17.67	1357	0.02	0.01	1426	7.52	Sesquiterpene
$\beta$ -Caryophyllene	20.55	1400	0.01	0.05	1513	9.84	Sesquiterpene
<i>trans</i> - $\alpha$ -Bergamotene	21.50	1411	0.03	0.01	1535	10.67	Sesquiterpene
Germacrene D	25.57	1460	0.02	[0.09]	1615	13.93*	Sesquiterpene
Bicyclgermacrene	26.58	1472	0.03	[0.13]	1639	15.24*	Sesquiterpene
Valencene	27.75	1485	0.01	0.02	1662	16.44	Sesquiterpene
$\delta$ -Cadinene	29.31	1505	0.03	0.02	1667	16.73	Sesquiterpene
$\beta$ -Sinensal	39.79	1693	0.02	0.02	2115	40.74	Sesquiterp. aldehyde
$\alpha$ -Sinensal	41.73	1753	0.02	0.02	2214	43.32	Sesquiterp. aldehyde
Nootkatone	43.02	1793	0.02	0.01	2349	46.35	Sesquiterp. ketone
Tangeretin	70.27	3166	0.05				Flavonoid
Heptamethoxyflavone isomer?	73.16	3338	0.11				Flavonoid
Hexamethoxyflavone isomer?	73.44	3352	0.15				Flavonoid
<b>Total identified</b>			<b>99.62%</b>	<b>99.05%</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*

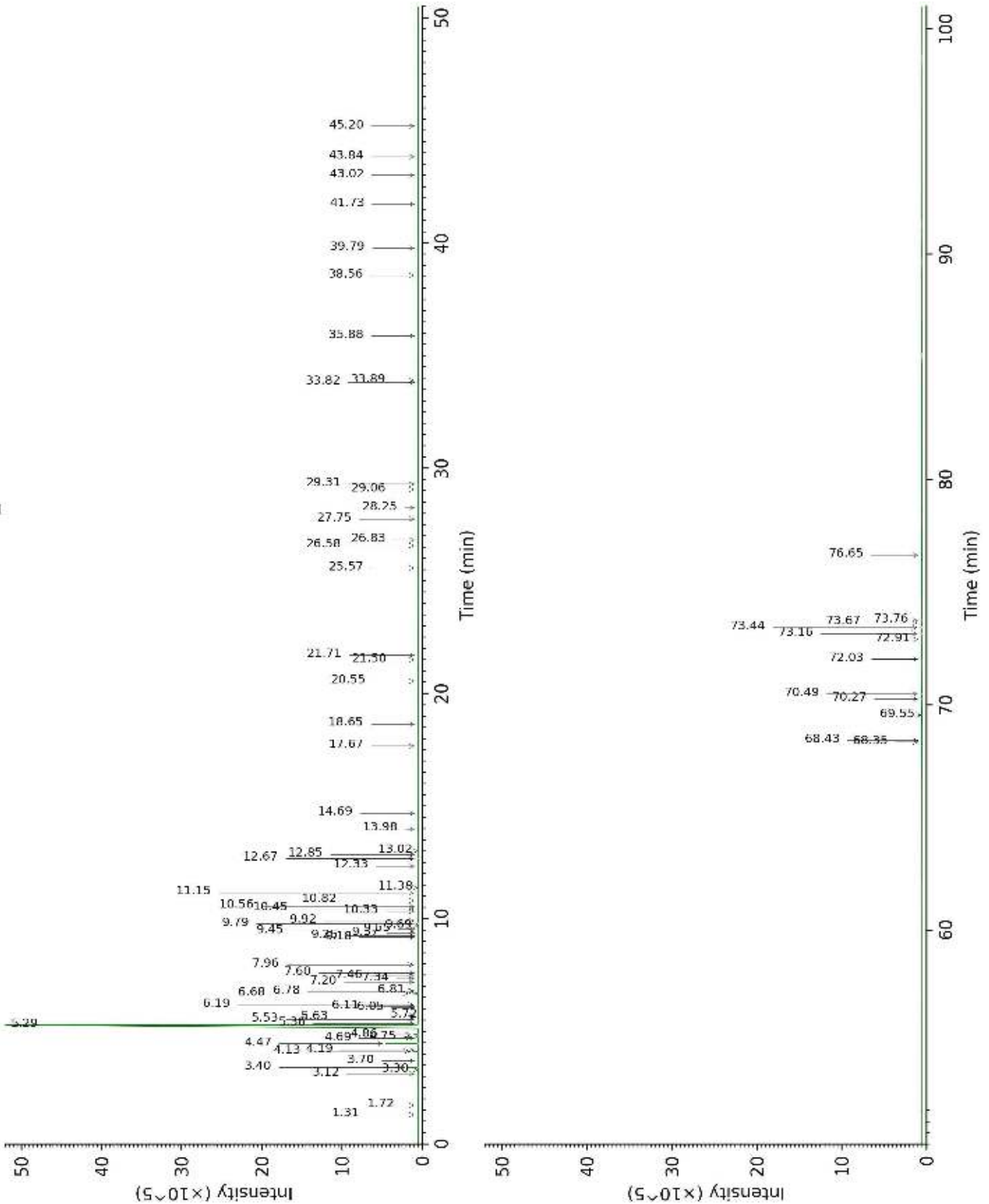
**Physical aspect :** Yellow liquid

**Refractive index :**  $1.4715 \pm 0.0003$  (20 °C)

*CONCLUSION*

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

17126-PTH1-1-CC\_BP5



17126-PTH1-1-CC\_WAX

