

**Date :** September 29, 2015

*SAMPLE IDENTIFICATION*

**Internal code :** 15I15-NGA1-1-HM

**Customer identification :** Grapefruit - #IS-132355

**Type :** Essential Oil

**Source :** *Citrus paradisi*

**Customer :** Nature's Gift Aromatherapy

*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.

**Analysis date :** 2015-09-16

IDENTIFIED COMPOUNDS

Identification	Colonne: BP5			Colonne: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Heptanal	2.54	909	0.01	0.01	1148	2.62	Aliphatic aldehyde
$\alpha$ -Pinene	2.79	925	0.49	0.49	984	1.06	Monoterpene
Sabinene	3.46	968	0.36	0.39	1082	1.86	Monoterpene
$\beta$ -Pinene	3.50	970	0.05	0.03	1062	1.69	Monoterpene
Myrcene	3.82	990	1.73	1.75	1134	2.45	Monoterpene
$\alpha$ -Phellandrene	4.05	1005	0.04	0.01	1125	2.34	Monoterpene
Octanal	4.18	1012	0.30	0.30	1253	4.03	Aliphatic aldehyde
cis- $\beta$ -Ocimene	4.60*	1036	94.47	0.01	1207	3.37	Monoterpene
1,8-Cineole	4.60*	1036	[94.47]	0.43	1171	2.91	Monoterp. ether
para-Cymene	4.60*	1036	[94.47]	0.01	1228	3.68	Monoterpene
Limonene	4.60*	1036	[94.47]	93.81	1170	2.89	Monoterpene
trans- $\beta$ -Ocimene	4.84	1049	0.10	0.09	1221	3.57	Monoterpene
Terpinolene	5.47	1086	0.01	0.00	1242	3.88	Monoterpene
Linalool	5.90	1108	0.08	0.09	1516	8.81	Monoterp. alcohol
Nonanal	5.96	1111	0.08	0.06	1356	5.56	Monoterp. aldehyde
cis-Limonene oxide	6.37	1130	0.05	0.06	1393	6.11	Monoterp. ether
trans-Limonene oxide	6.46	1134	0.03	0.04	1404	6.31	Monoterp. ether
Citronellal	6.88	1153	0.08	0.08	1434	6.92	Monoterp. aldehyde
Decanal	8.32	1211	0.30	0.27	1454	7.35	Aliphatic aldehyde
Neral	9.57	1245	0.06	0.06	1617	12.39	Monoterp. aldehyde
Geranial	10.64	1274	0.03	0.04	1666	14.72	Monoterp. aldehyde
Bornyl acetate	10.73	1276	0.01	0.01	1521	8.98	Monoterp. ester
$\alpha$ -Copaene	14.74	1355	0.11	0.12	1438	7.02	Sesquiterpene
$\beta$ -Cubebene	15.61	1370	0.09	0.08	1488	8.05	Sesquiterpene
Geranyl acetate	16.37	1383	0.07	0.06	1711	16.96	Monoterp. ester
$\beta$ -Caryophyllene	17.20	1398	0.29	0.29	1528	9.22	Sesquiterpene
Dodecanal	18.37	1414	0.02	0.02	1659	14.38	Aliphatic aldehyde
$\alpha$ -Humulene	19.66	1431	0.04	0.04	1595	11.40	Sesquiterpene
Germacrene D	21.67	1457	0.06	0.10	1629	12.96	Sesquiterpene
$\delta$ -Cadinene	25.14	1503	0.11	0.11	1685	15.58	Sesquiterpene
Nootkatone	41.09	1787	0.44	0.45	2363	45.59	Sesquiterp. ketone
<b>Total identified</b>			<b>99.51%</b>	<b>99.31%</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 :**  $1.4775 \pm 0.0003$  (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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