

**Date :** September 20, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17I07-ORA15-1-DM

**Customer identification :** Cinnamon

**Type :** Essential oil

**Source :** *Cinnamomum zeylanicum*

**Customer :** Organic Aromas

*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 :** Sylvain Mercier, M. Sc., chimiste

**Analysis date :** 2017-09-19

Checked and approved by :

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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.	
Acetic acid	0.55	658	0.06	0.06	1391	6.71*	Aliphatic acid
Styrene	2.89	895	0.13	0.33	1183	3.60*	Phenylpropanoid
$\alpha$ -Thujene	3.31	920	0.26	0.49	948	1.23	Monoterpene
$\alpha$ -Pinene	3.41	926	1.03	0.79	938	1.19	Monoterpene
Camphene	3.70*	943	0.50	0.47	989	1.49	Monoterpene
$\alpha$ -Fenchene	3.70*	943	[0.50]	0.02	982	1.43	Monoterpene
Sabinene	4.13	969	0.09	0.12	1055	2.03	Monoterpene
$\beta$ -Pinene	4.19	972	0.37	0.41	1035	1.86	Monoterpene
Benzaldehyde	4.21	973	0.37	0.90	1429	7.58*	Simple phenolic
$\alpha$ -Phellandrene	4.75*	1005	1.08	0.96	1104	2.54	Monoterpene
$\Delta^3$ -Carene	4.75*	1005	[1.08]	0.08	1089	2.34	Monoterpene
$\alpha$ -Terpinene	4.94	1015	1.07	1.10	1119	2.72	Monoterpene
para-Cymene	5.15	1026	2.65	2.60	1208	3.88*	Monoterpene
Limonene	5.18	1028	0.88	0.64	1137	2.96	Monoterpene
$\beta$ -Phellandrene	5.22	1030	4.61	5.25	1144	3.05*	Monoterpene
1,8-Cineole	5.24	1031	0.21	[5.25]	1144	3.05*	Monoterp. ether
cis- $\beta$ -Ocimene	5.35	1037	0.08	[0.33]	1183	3.60*	Monoterpene
trans- $\beta$ -Ocimene	5.53	1047	0.01	[2.60]	1208	3.88*	Monoterpene
$\gamma$ -Terpinene	5.72	1057	0.13	[0.33]	1183	3.60*	Monoterpene
cis-Linalool oxide (fur.)	6.00	1072	0.01	[0.06]	1391	6.71*	Monoterp. alcohol
cis-Sabinene hydrate	6.05	1075	0.02	0.04	1400	6.92*	Monoterp. alcohol
Acetophenone	6.09	1077	0.03	0.03	1557	11.48	Simple phenolic
Isoterpinolene	6.11	1079	0.01	[2.60]	1208	3.88*	Monoterpene
Terpinolene	6.19	1083	0.11	0.11	1223	4.10	Monoterpene
trans-Linalool oxide (fur.)	6.32	1090	0.01	[0.04]	1400	6.92*	Monoterp. alcohol
para-Cymenene	6.41	1095	0.04	0.03	1365	6.29	Monoterpene
Linalool	6.71	1107	2.52	2.58	1493	9.14*	Monoterp. alcohol
cis-para-Menth-2-en-1-ol	7.22	1125	0.08	[2.58]	1493	9.14*	Monoterp. alcohol
Camphor	7.73	1144	0.06	0.07	1419	7.35	Monoterp. ketone
Hydrocinnamaldehyde	8.48	1171	0.33				Phenylpropanoid
Borneol	8.63	1176	0.13	0.73	1617	14.03*	Monoterp. alcohol
Terpinen-4-ol	8.80	1183	0.67	0.70	1522	10.18*	Monoterp. alcohol
para-Cymen-8-ol	9.36	1201	0.08	0.06	1759	22.46	Monoterp. alcohol
$\alpha$ -Terpineol	9.47	1203	0.68	[0.73]	1617	14.03*	Monoterp. alcohol
$\alpha$ -Phellandrene epoxide	9.95	1214	0.07	0.08	1713	19.34	Monoterpene
(Z)-Cinnamaldehyde	10.52	1226	0.26	0.23	1764	22.77	Phenylpropanoid
Hydrocinnamyl alcohol	11.19	1241	0.11	0.14	1939	34.36	Phenylpropanoid
(E)-Cinnamaldehyde	13.82	1299	54.11	55.61	1907	32.88*	Phenylpropanoid
(E)-Cinnamyl alcohol	15.53	1324	1.03	1.13	2162	41.96	Phenylpropanoid
$\alpha$ -Copaene	17.76*	1358	3.14	[0.90]	1429	7.58*	Sesquiterpene
Eugenol	17.76*	1358	[3.14]	2.83	2053	38.88	Phenylpropanoid

Hydrocinnamyl acetate	18.72	1372	0.19				Phenylpropanoid ester
β-Elemene	18.93	1376	0.08	[0.70]	1522	10.18*	Sesquiterpene
β-Caryophyllene	20.71	1401	4.42	4.47	1517	9.99	Sesquiterpene
α-Humulene	23.43	1434	0.79	0.77	1578	12.28	Sesquiterpene
(E)-Cinnamyl acetate	25.37	1457	10.54	10.94	2036	38.33	Phenylpropanoid ester
ar-Curcumene	26.61	1472	0.10	0.10	1693	18.03	Sesquiterpene
Bicyclogermacrene	26.90*	1475	0.11	0.04	1636	15.07	Sesquiterpene
Ethyl (E)-cinnamate	26.90*	1475	[0.11]	0.05	2009	37.45	Phenylpropanoid ester
(E)-Cinnamic acid	27.18	1479	0.11				Phenylpropanoid
δ-Cadinene	29.35	1506	0.06	0.40	1667	16.73	Sesquiterpene
(E)-o-Methoxycinnamaldehyde	32.33	1548	0.58	0.63	2287	45.00	Phenylpropanoid
Caryophyllenyl alcohol	33.69	1567	0.17				Sesquiterp.a lcohol
Caryophyllene oxide	33.84	1569	0.68	0.59	1841	28.22	Sesquiterp. ether
Humulene epoxide II	35.49	1592	0.12	[55.61]	1907	32.88*	Sesquiterp. ether
Tetradecanal	36.82	1620	0.14				Aliphatic aldehyde
Benzyl benzoate	42.32	1771	1.23	1.35	2470	48.87	Phenolic ester
Unknown (m/z = 93, 92 (56), 136 (40), 91 (39), 77 (19), 169 (11)... 268 (4))	47.92	1979	0.25				
Unknown (m/z = 69, 91 (61), 41 (47), 181 (27), 169 (22)... 268 (18))	51.09	2114	0.34				
Unknown (m/z = 69, 91 (71), 41 (51), 93 (32), 169 (30)... 239 (18), 268 (13))	51.28	2123	0.16				
<b>Total identified</b>			<b>96.35%</b>	<b>97.93%</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

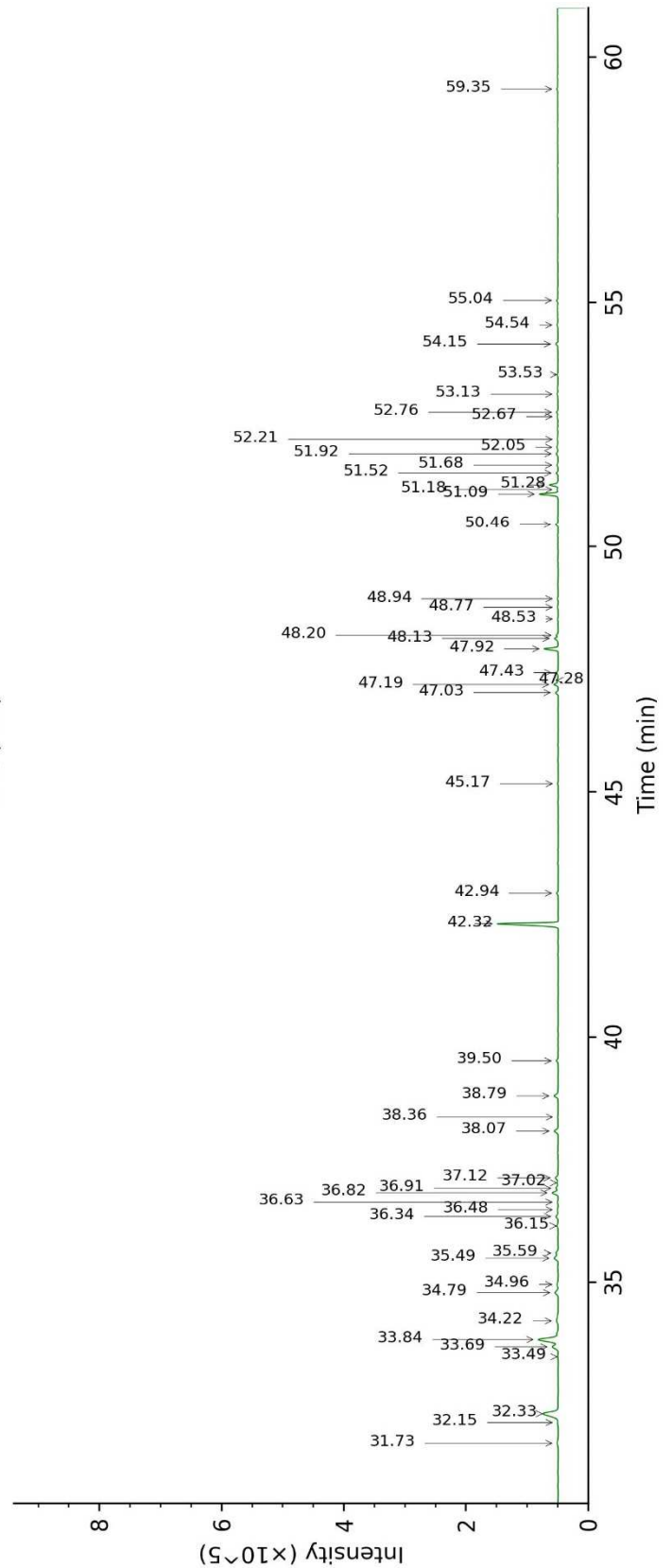
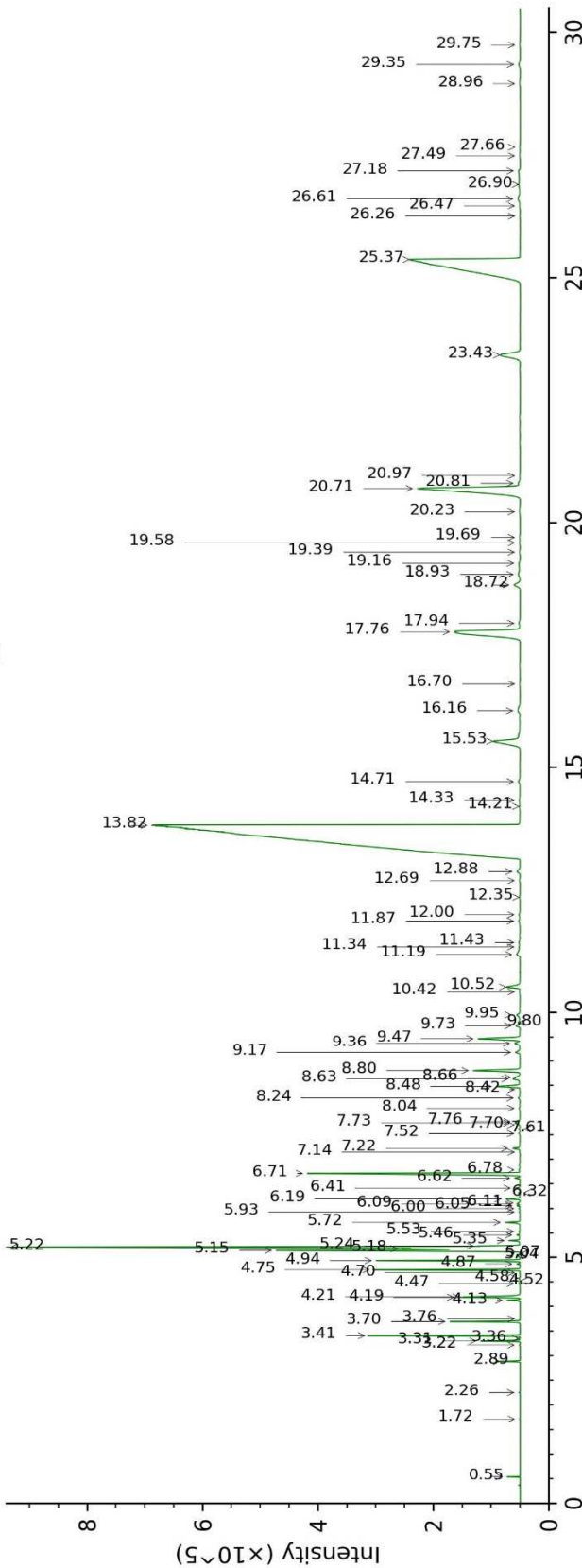
**Physical aspect :** Yellow liquid

**Refractive index :** 1.5620 ± 0.0003 (20 °C)

#### CONCLUSION

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

17107-ORA15-1-DM\_BP5



17107-ORA15-1-DM\_WAX

