

Date : March 18, 2016

SAMPLE IDENTIFICATION

Internal code : 16C03-MJO1-1-LC

Customer identification : Young Living - Cinnamon Bark - Lot #16121203 - Untampered seal

Type : Essential oil

Source : *Cinnamomum zeylanicum*

Customer : Miles Jordens

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 : 2016-03-17

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.	
Tricyclene	2.98	914	tr	tr	930	0.82	Monoterpene
α -Thujene	3.07	920	0.02	0.03	958	0.93	Monoterpene
α -Pinene	3.17	926	0.92	0.93	949	0.90	Monoterpene
α -Fenchene	3.42	942	0.04	0.06	994	1.08	Monoterpene
Camphene	3.44	943	0.32	0.30	1004	1.13	Monoterpene
Sabinene	3.86	968	0.01	0.01	1072	1.66	Monoterpene
β -Pinene	3.88	969	0.36	0.39	1042	1.43	Monoterpene
Benzaldehyde	3.92	972	0.49	0.28	1442	6.60	Simple phenolic
Myrcene	4.20	989	0.08	0.08	1118	2.07	Monoterpene
α -Phellandrene	4.46*	1005	1.09	0.92	1110	1.99	Monoterpene
Δ^3 -Carene	4.46*	1005	[1.09]	0.19	1092	1.83	Monoterpene
Octanal	4.62	1014	tr	tr	1240	3.57	Aliphatic aldehyde
α -Terpinene	4.65	1015	0.02	0.02	1124	2.14	Monoterpene
meta-Cymene	4.73	1020	0.04				Monoterpene
para-Cymene	4.83	1025	3.07	3.17	1214	3.20	Monoterpene
Limonene	4.87*	1028	0.67	0.67	1141	2.35	Monoterpene
β -Phellandrene	4.87*	1028	[0.67]	0.51	1148	2.43*	Monoterpene
1,8-Cineole	4.93	1031	0.48	[0.51]	1148	2.43*	Monoterp. ether
cis- β -Ocimene	4.99	1035	0.01	0.26	1190	2.92*	Monoterpene
γ -Terpinene	5.41	1058	0.25	[0.26]	1190	2.92*	Monoterpene
cis-Linalool oxide (fur.)	5.70	1074	0.02	0.02	1389	5.68	Monoterp. alcohol
Isoterpinolene	5.80	1080	tr	tr	1222	3.31	Monoterpene
Terpinolene	5.87	1084	0.17	0.16	1226	3.37	Monoterpene
trans-Linalool oxide (fur.)	5.99	1091	0.03	0.03	1415	6.09	Monoterp. alcohol
α -Linalool?	6.04	1094	0.73	6.75	1509	7.87*	Monoterp. alcohol
Linalool	6.30	1106	5.68	[6.75]	1509	7.87*	Monoterp. alcohol
Nonanal	6.35	1108	0.04	0.05	1343	5.01	Aliphatic aldehyde
Plinol isomer II	6.63	1119	0.01	0.01	1538	8.67*	Monoterp. alcohol
Linalyl methyl ether	6.84	1127	0.03	0.01	1281	4.14	Monoterp. ether
1-Terpineol	7.04	1136	0.03	0.03	1530	8.45*	Monoterp. alcohol
Camphor	7.26	1144	0.10	0.09	1428	6.34	Monoterp. ketone
cis- β -Terpineol	7.39	1149	0.03	0.03	1571	9.66	Monoterp. alcohol
trans- β -Terpineol	7.93	1170	0.04	0.02	1628	11.58	Monoterp. alcohol
Terpinen-4-ol	8.14	1179	0.02	[0.01]	1538	8.67*	Monoterp. alcohol
α -Terpineol	8.67	1200	0.89	0.90	1634	11.84	Monoterp. alcohol
α -Phellandrene epoxide	8.77*	1203	0.06	0.01	1729	16.29	Monoterpene
Methylchavicol	8.77*	1203	[0.06]	0.02	1590	10.26	Phenylpropanoid
γ -Terpineol	8.83	1204	0.14	0.14	1637	11.99	Monoterp. alcohol
(Z)-Cinnamaldehyde	9.64	1224	0.36	0.20	1780	19.31	Phenylpropanoid
Cuminal	10.41	1241	0.09	0.09	1678	13.84	Monoterp. aldehyde
Geraniol	10.93	1254	0.08	0.09	1792	19.98	Monoterp. alcohol

(E)-Cinnamaldehyde	12.62	1294	65.99	66.39	1927	29.10	Phenylpropanoid
α-Methylcinnamaldehyde	14.57	1328	0.01				Phenylpropanoid
(2Z,4Z)-5-Phenylpentadienal	15.21	1339	0.01				Synthetic
Eugenol	16.21*	1355	5.16	5.34	2074	36.73*	Phenylpropanoid
α-Copaene	16.21*	1355	[5.16]	tr	1432	6.40	Sesquiterpene
Isocaryophyllene	18.21	1387	0.11	[6.75]	1509	7.87*	Sesquiterpene
β-Caryophyllene	19.28	1404	6.29	6.47	1527	8.34	Sesquiterpene
(2Z,4E)-5-Phenylpentadienal	19.84	1410	0.04	0.02	2008	34.02	Synthetic
α-Guaiene	19.94*	1412	0.12	[0.03]	1530	8.45*	Sesquiterpene
Aromadendrene	19.94*	1412	[0.12]	[0.03]	1530	8.45*	Sesquiterpene
Methyleugenol	19.94*	1412	[0.12]	0.08	1943	30.07	Phenylpropanoid
(2E,4Z)-5-Phenylpentadienal	21.50	1431	0.07	[5.34]	2074	36.73*	Synthetic
α-Humulene	21.79	1434	1.05	1.06	1583	10.06	Sesquiterpene
allo-Aromadendrene	22.04	1437	tr	0.01	1560	9.37	Sesquiterpene
(E)-Cinnamyl acetate	23.21	1452	3.44	3.36	2049	35.90	Phenylpropanoid ester
Butylated hydroxytoluene	26.84	1496	0.01	0.01	1846	23.43	Synthetic
Caryophyllene oxide	32.16*	1565	0.06	0.05	1851	23.79	Sesquiterp. ether
(2E,4E)-5-Phenylpentadienal	32.16*	1565	[0.06]	0.01	2152	39.27	Synthetic
Benzyl benzoate	41.24	1763	0.90	0.41	2489	47.04	Phenolic ester
Total identified			99.68%	99.68%			

*: 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 : Slightly yellow liquid

Refractive index : 1.5770 ± 0.0003 (20 °C)

CONCLUSION

The sample has been adulterated with synthetic cinnamaldehyde, indicated by the presence of phenylpentadienal isomers. Synthetic linalool may also have been added.



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