

GC/MS BATCH NUMBER: CA3102

ESSENTIAL OIL: CARDAMOM
BOTANICAL NAME: Elettaria cardamomum
ORIGIN: GUATEMALA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF CARDAMOM OIL	%
α -TERPINYL ACETATE	39.2
1,8-CINEOLE	32.7
LINALYL ACETATE	5.5
SABINENE	3.8
LINALOOL	3.7
LIMONENE	2.4
MYRCENE	1.7
α -PINENE	1.6
α -TERPINEOL	1.5
TERPINEN-4-OL	0.9
(E)-NEROLIDOL	0.7

Comments from Robert Tisserand: Excellent fresh odor quality. Conforms to all 11 key ISO constituents.

Date : June 15, 2016

SAMPLE IDENTIFICATION

Internal code : 16F09-PTH4-1-SM

Customer identification : Cardamon - Guatemala - CA3102510

Type : Essential oil

Source : *Elettaria cardamomum*

Customer : Plant Therapy

ANALYSIS

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

Analyst : Sylvain Mercier, M. Sc., chimiste

Analysis date : 2016-06-15

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.	
Hexanal	1.67	803	0.01	0.01	1018	1.24	Aliphatic aldehyde
α -Thujene	3.25	923	0.23	0.34	963	0.96	Monoterpene
α -Pinene	3.35	929	1.61	1.46	955	0.92	Monoterpene
α -Fenchene	3.61	945	0.01	0.01	1001	1.11	Monoterpene
Camphene	3.63	946	0.02	0.02	1008	1.16	Monoterpene
Sabinene	4.07	973	3.78	3.79	1065	1.61	Monoterpene
β -Pinene	4.13	976	0.40	0.37	1046	1.46	Monoterpene
Myrcene	4.41	993	1.73	1.68	1122	2.12	Monoterpene
6-Methyl-5-hepten-2-one	4.50	999	0.05	0.05	1282	4.16	Aliphatic ketone
α -Phellandrene	4.67	1009	0.03	0.02	1114	2.04	Monoterpene
Octanal	4.81	1016	0.09	0.09	1239	3.55	Aliphatic aldehyde
α -Terpinene	4.86	1019	0.15	0.18	1128	2.20	Monoterpene
para-Cymene	5.09*	1032	2.64	0.23	1215	3.22	Monoterpene
Limonene	5.09*	1032	[2.64]	35.03	1159	2.56*	Monoterpene
1,8-Cineole	5.22	1039	32.65	[35.03]	1159	2.56*	Monoterp. ether
<i>cis</i> - β -Ocimene	5.28	1042	0.07	0.44	1196	2.99*	Monoterpene
<i>trans</i> - β -Ocimene	5.45	1052	0.06	0.05	1210	3.15	Monoterpene
γ -Terpinene	5.64	1062	0.43	[0.44]	1196	2.99*	Monoterpene
<i>cis</i> -Linalool oxide (fur.)	5.96	1080	0.01	0.01	1387	5.65	Monoterp. alcohol
<i>cis</i> -Sabinene hydrate	6.03	1084	0.42	0.65	1415	6.09	Monoterp. alcohol
Terpinolene	6.10	1088	0.12	0.12	1231	3.44	Monoterpene
Octanol	6.23	1095	0.05	0.07	1513	7.96*	Aliphatic alcohol
6,7-Epoxyterpinene	6.36	1102	0.03	0.03	1358	5.23	Monoterp. ether
Linalool	6.70	1115	3.67	3.38	1504	7.77	Monoterp. alcohol
<i>cis</i> -para-Menth-2-en-1-ol	7.18	1133	0.05	[0.07]	1513	7.96*	Monoterp. alcohol
Borneol	8.58	1185	0.08	1.66	1634	11.87*	Monoterp. alcohol
Terpinen-4-ol	8.71	1190	0.91	0.89	1536	8.62*	Monoterp. alcohol
α -Terpineol	9.43	1211	1.50	[1.66]	1634	11.87*	Monoterp. alcohol
Decanal	9.65	1216	0.01	0.01	1446	6.67	Aliphatic aldehyde
γ -Terpineol	9.73	1218	0.22	0.30	1636	11.96	Monoterp. alcohol
<i>trans</i> -Piperitol	9.80	1219	0.06	0.04	1678	13.82	Monoterp. alcohol
Neral	11.03	1247	0.22	0.29	1606	10.78	Monoterp. aldehyde
Linalyl acetate	11.33	1254	5.51	5.58	1512	7.93	Monoterp. ester
Geraniol	12.07	1271	0.99	0.97	1787	19.70	Monoterp. alcohol
Geranial	12.52	1281	0.29	0.28	1656	12.83	Monoterp. aldehyde
δ -Terpinyl acetate	14.39	1316	0.17	0.15	1578	9.89	Monoterp. ester
α -Terpinyl acetate	16.79	1354	39.18	39.51	1633	11.79*	Monoterp. ester
Neryl acetate	17.68	1368	0.03	0.03	1666	13.29	Monoterp. ester
β -Elemene	18.62	1382	0.03	[0.89]	1536	8.62*	Sesquiterpene
Geranyl acetate	19.18*	1391	0.58	0.58	1698	14.73	Monoterp. ester
Longifolene	19.18*	1391	[0.58]	0.24	1490	7.50	Sesquiterpene

β -Caryophyllene	20.23	1406	0.03	0.03	1515	8.00	Sesquiterpene
β -Selinene	25.75	1473	0.28	[39.51]	1633	11.79*	Sesquiterpene
α -Selinene	26.39	1481	0.10	0.08	1643	12.26	Sesquiterpene
(E)-Nerolidol	33.79	1579	0.71	0.72	1997	33.35	Sesquiterp. alcohol
(2E,6E)-Farnesol	40.69	1734	0.03	0.02	2294	42.89	Sesquiterp. alcohol
Total identified			99.24%	99.41%			

*: 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 : Clear liquid

Refractive index : 1.4615 \pm 0.0003 (20 °C)

CONCLUSION

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



