

GC/MS BATCH NUMBER: R40103

ESSENTIAL OIL: ROSEMARY
BOTANICAL NAME: ROSMARINUS OFFICINALIS
ORIGIN: TUNISIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF ROSEMARY OIL	%
1,8-CINEOLE + LIMONENE	48.6
α -PINENE	11.2
CAMPHOR	9.9
β -PINENE	6.9
CAMPHENE	4.3
β -CARYOPHYLLENE	4.1
BORNEOL	2.4
α -TERPINEOL	1.7
para-CYMENE	1.4
MYRCENE	1.3
BORNYL ACETATE	0.9
LINALOOL	0.8
VERBENONE	0.01

Comments from Robert Tisserand: A cineole chemotype of Rosemary oil with excellent odor quality, and 12 of 13 key ISO constituents

Date : November 25, 2016

SAMPLE IDENTIFICATION

Internal code : 16K14-PTH18-1-DM

Customer identification : Rosemary - R4010363R

Type : Essential oil

Source : *Rosmarinus officinalis*

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 : 2016-11-22

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.	
<i>cis</i> -Hex-3-en-1-ol	2.50	865	0.02	0.02	1312	4.50	Aliphatic alcohol
Tricyclene	3.17	913	0.17	0.15	923	0.77	Monoterpene
α -Thujene	3.26	919	0.24	0.53	951	0.88	Monoterpene
α -Pinene	3.40	927	11.24	11.33	948	0.87	Monoterpene
Camphene	3.67*	943	4.30	4.35	995	1.07	Monoterpene
α -Fenchene	3.67*	943	[4.30]	0.07	981	1.01	Monoterpene
Thuja-2,4(10)-diene	3.74	948	0.02	0.16	1051	1.46*	Monoterpene
Sabinene	4.09	969	0.12	[0.16]	1051	1.46*	Monoterpene
β -Pinene	4.17	974	6.86	7.00	1038	1.36	Monoterpene
Myrcene	4.43	990	1.33	1.31	1111	1.95	Monoterpene
Octen-3-ol	4.65	1002	0.13	0.12	1390	5.61	Aliphatic alcohol
α -Phellandrene	4.70*	1005	0.30	0.11	1105	1.89	Monoterpene
Δ 3-Carene	4.70*	1005	[0.30]	0.16	1085	1.72	Monoterpene
α -Terpinene	4.89	1015	0.39	0.44	1120	2.03	Monoterpene
1,8-Cineole	5.29*	1038	50.59	48.55	1153	2.43*	Monoterp. ether
Limonene	5.29*	1038	[50.59]	[48.55]	1153	2.43*	Monoterpene
para-Cymene	5.29*	1038	[50.59]	1.35	1203	3.00	Monoterpene
<i>cis</i> - β -Ocimene	5.31	1039	0.06	0.61	1184	2.78*	Monoterpene
<i>trans</i> - β -Ocimene	5.48	1048	0.03	0.03	1192	2.88	Monoterpene
γ -Terpinene	5.67	1059	0.63	[0.61]	1184	2.78*	Monoterpene
<i>cis</i> -Sabinene hydrate	6.01	1077	0.11	0.11	1402	5.79	Monoterp. alcohol
Terpinolene	6.13	1083	0.29	0.28	1219	3.20	Monoterpene
para-Cymenene	6.34	1095	0.03	0.03	1361	5.20	Monoterpene
Linalool	6.70	1109	0.80	0.78	1483	7.23	Monoterp. alcohol
Camphor	7.76	1148	9.92	10.09	1421	6.06	Monoterp. ketone
Camphene hydrate	7.96	1156	0.04	0.04	1511	7.75	Monoterp. alcohol
Borneol	8.66*	1182	2.55	2.35	1608	10.56*	Monoterp. alcohol
Isoborneol	8.66*	1182	[2.55]	0.40	1579	9.69	Monoterp. alcohol
Terpinen-4-ol	8.73	1185	0.71	4.75	1524	8.02*	Monoterp. alcohol
para-Cymen-8-ol	9.21	1200	0.02	0.02	1757	17.16	Monoterp. alcohol
α -Terpineol	9.44	1205	1.74	1.76	1619	10.85*	Monoterp. alcohol
Verbenone	9.68	1211	0.01	[2.35]	1608	10.56*	Monoterp. ketone
Bornyl acetate	12.75	1279	0.90	0.90	1495	7.46	Monoterp. ester
α -Cubebene	15.71	1329	0.03	0.04	1410	5.91	Sesquiterpene
α -Copaene	17.41	1355	0.22	0.28	1433	6.31	Sesquiterpene
Eugenol	17.60	1358	0.01	0.01	2046	35.04	Phenylpropanoid
β -Caryophyllene	20.41	1400	4.08	[4.75]	1524	8.02*	Sesquiterpene
α -Humulene	23.06	1432	0.45	0.41	1588	9.92	Sesquiterpene
γ -Muurolene	25.09	1457	0.17	[1.76]	1619	10.85*	Sesquiterpene
α -Muurolene	27.24	1482	0.05	0.05	1635	11.42	Sesquiterpene
γ -Cadinene	28.28	1495	0.09	0.08	1667	12.85	Sesquiterpene

β -Bisabolene	28.47	1497	0.06	0.05	1657	12.46	Sesquiterpene
δ -Cadinene	28.95	1504	0.21	0.21	1671	13.07	Sesquiterpene
Caryophyllene oxide	33.52	1566	0.12	0.09	1845	22.40	Sesquiterp. ether
Total identified	99.04%			99.02%			

*: 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 : 1.4655 \pm 0.0003 (20 °C)

CONCLUSION

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

