

Date : October 28, 2016

SAMPLE IDENTIFICATION

Internal code : 16J20-TOB36-1-DM

Customer identification : Rosemary - Spain

Type : Essential oil

Source : *Rosmarinus officinalis*

Customer : TruIQ Global, LLC

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 : 2016-10-28

Checked and approved by :



Sylvain Mercier, M. Sc., chimiste 2014-005

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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	0.01	0.01	1341	4.91	Aliphatic alcohol
Tricyclene	3.16	913	0.20	0.17	922	0.77	Monoterpene
α -Thujene	3.25	918	0.30	14.23	949	0.87†	Monoterpene
α -Pinene	3.38	926	13.84	[14.23]	944	0.85†	Monoterpene
Camphene	3.65*	942	6.57	6.33	993	1.06	Monoterpene
α -Fenchene	3.65*	942	[6.57]	0.35	980	1.00	Monoterpene
Thuja-2,4(10)-diene	3.74	947	0.14	0.21	1050	1.45*	Monoterpene
Sabinene	4.07	968	0.12	[0.21]	1050	1.45*	Monoterpene
β -Pinene	4.15	972	6.69	6.57	1036	1.34	Monoterpene
Myrcene	4.42	989	1.61	1.52	1110	1.93	Monoterpene
Octan-3-one	4.46	991	0.14	1.14	1201	2.98*	Aliphatic ketone
Octen-3-ol	4.55	997	0.16	0.32	1432	6.28*	Aliphatic alcohol
α -Phellandrene	4.68*	1004	0.21	0.18	1103	1.87	Monoterpene
Δ 3-Carene	4.68*	1004	[0.21]	0.04	1083	1.71	Monoterpene
α -Terpinene	4.87	1015	0.36	0.45	1118	2.01	Monoterpene
para-Cymene	5.12*	1029	2.07	[1.14]	1201	2.98*	Monoterpene
Limonene	5.12*	1029	[2.07]	40.37	1146	2.34*	Monoterpene
1,8-Cineole	5.22	1034	39.10	[40.37]	1146	2.34*	Monoterp. ether
<i>cis</i> - β -Ocimene	5.29	1038	0.04	0.71	1182	2.76*	Monoterpene
<i>trans</i> - β -Ocimene	5.47	1048	0.04	[1.14]	1201	2.98*	Monoterpene
γ -Terpinene	5.65	1058	0.75	[0.71]	1182	2.76*	Monoterpene
<i>cis</i> -Sabinene hydrate	6.00	1076	0.08	0.07	1402	5.78	Monoterp. alcohol
Terpinolene	6.12	1083	0.29	0.28	1218	3.19	Monoterpene
Fenchone	6.27	1091	0.01	0.01	1314	4.52	Monoterp. ketone
para-Cymenene	6.34	1095	0.03	0.02	1362	5.21	Monoterpene
Linalool	6.66	1107	1.15	1.20	1485	7.26*	Monoterp. alcohol
endo-Fenchol	7.03	1121	0.02	0.02	1512	7.78	Monoterp. alcohol
<i>trans</i> -Pinocarveol	7.60	1142	0.05	0.28	1579	9.69	Monoterp. alcohol
Camphor	7.71	1147	14.20	14.40	1420	6.05*	Monoterp. ketone
Camphene hydrate	7.94	1155	0.09	1.95	1524	8.03*	Monoterp. alcohol
Pinocarvone	8.09	1161	0.04	0.06	1472	7.03	Monoterp. ketone
Isoborneol	8.49	1176	0.18	0.50	1589	9.95*	Monoterp. alcohol
Borneol	8.59	1180	2.71	2.57	1610	10.58*	Monoterp. alcohol
Terpinen-4-ol	8.69	1183	0.84	[1.95]	1524	8.03*	Monoterp. alcohol
α -Terpineol	9.37	1204	1.53	1.51	1619	10.87*	Monoterp. alcohol
Verbenone	9.68	1211	0.21	[1.51]	1619	10.87*	Monoterp. ketone
Bornyl acetate	12.72	1278	1.12	1.21	1495	7.47	Monoterp. ester
α -Cubebene	15.70	1329	0.04	[14.40]	1420	6.05*	Sesquiterpene
α -Copaene	17.38	1355	0.13	[0.32]	1432	6.28*	Sesquiterpene
Eugenol	17.55	1358	0.02	0.01	2068	35.82	Phenylpropanoid
Longifolene	19.23	1384	0.02	[1.20]	1485	7.26*	Sesquiterpene

β -Caryophyllene	20.30	1399	3.07	1.79	1522	7.98	Sesquiterpene
α -Humulene	23.02	1432	0.38	[0.50]	1589	9.95*	Sesquiterpene
γ -Muurolene	25.06	1456	0.10	[2.57]	1610	10.58*	Sesquiterpene
Germacrene D	25.36	1460	0.02	[1.51]	1619	10.87*	Sesquiterpene
Bicyclogermacrene	26.45	1472	0.02	0.04	1646	11.93	Sesquiterpene
γ -Cadinene	28.25	1494	0.07	0.06	1667	12.87	Sesquiterpene
β -Bisabolene	28.45	1497	0.05	0.05	1657	12.47	Sesquiterpene
δ -Cadinene	28.91	1503	0.14	0.14	1672	13.10	Sesquiterpene
Caryophyllene oxide	33.48	1566	0.13	0.10	1846	22.46	Sesquiterp. ether
Total identified			99.09%	98.87%			

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

†: Peaks apexes were resolved, but peaks overlapped and were summed for analysis

Note: no correction factor was applied

OTHER DATA

Physical aspect : Clear liquid

Refractive index : 1.4665 \pm 0.0003 (20 °C)

CONCLUSION

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



