

GC/MS BATCH NUMBER: C90108

ESSENTIAL OIL: ROMAN CHAMOMILE
BOTANICAL NAME: CHAMAEMELUM NOBILE
ORIGIN: UK

KEY CONSTITUENTS PRESENT IN THIS BATCH OF ROMAN CHAMOMILE OIL	%
3-METHYLAMYL ANGELATE	18.9
METHALLYL ANGELATE	16.3
3-METHYLAMYL ISOBUTYRATE	10.5
ISOAMYL ANGELATE	7.4
2-METHYLBUTYL ANGELATE	6.0
trans-PINOCARVEOL	5.7
ISOBUTYL ANGELATE	3.8
α -PINENE	3.2
2-METHYLBUTYL ISOBUTYRATE	2.2
PINOCARVONE	2.1
ISOAMYL ISOBUTYRATE	1.5
3-METHYLAMYL METHACRYLATE	1.5
METHALLYL METHACRYLATE	1.1

Comments from Robert Tisserand: This is a good quality, UK-grown Roman Chamomile oil with an apple-hay odor.

Date : October 14, 2016

SAMPLE IDENTIFICATION

Internal code : 16J11-PTH6-1-DM

Customer identification : English Chamomile - C9010855R

Type : Essential oil

Source : *Chamaemelum nobile*

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 : 2016-10-13

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.	
2-Methylbutyral	0.58	587	0.02	0.02	769	0.48	Aliphatic aldehyde
Isopropyl formate	0.65	612	0.05				Aliphatic ester
Isoamyl alcohol	1.13	726	0.11	2.99	1144	2.32*	Aliphatic alcohol
2-Methylbutyl alcohol	1.16	730	0.10	[2.99]	1144	2.32*	Aliphatic alcohol
(E)-2-Penten-1-ol	1.21	737	0.02				Aliphatic alcohol
Ethyl isobutyrate	1.28	747	0.02	0.01	825	0.56	Aliphatic ester
Methyl 2-methylbutyrate	1.37	759	0.02	0.02	923	0.77	Aliphatic ester
Isobutyl acetate	1.44	770	0.06				Aliphatic ester
Hexanal	1.67	800	0.04	0.03	1017	1.18	Aliphatic aldehyde
Butyric acid	1.83	813	0.08				Aliphatic acid
Methyl angelate	1.91	819	0.09	0.10	1044	1.40	Aliphatic ester
Ethyl 2-methylbutyrate	2.21	843	0.04	0.57	992	1.05*	Aliphatic ester
3-Methylpentanol	2.35	854	0.53	0.72	1265	3.84*	Aliphatic alcohol
Propyl isobutyrate	2.41	859	0.04	[0.57]	992	1.05*	Aliphatic ester
cis-Hex-3-en-1-ol	2.49	864	0.05	0.08	1328	4.72	Aliphatic alcohol
Isoamyl acetate	2.64	876	0.48	0.61	1054	1.48*	Aliphatic ester
2-Methylbutyl acetate	2.67	878	0.15	[0.61]	1054	1.48*	Aliphatic ester
Hexanol	2.70	880	0.06	0.11	1293	4.22	Aliphatic alcohol
Propyl methacrylate	2.72	882	0.06	0.07	1061	1.54	Aliphatic ester
Ethyl angelate?	2.92	898	0.12				Aliphatic ester
Isobutyl isobutyrate	3.18	914	0.76	0.73	1030	1.29	Aliphatic ester
α-Pinene	3.36	925	3.23	3.18	943	0.85	Monoterpene
Prenyl acetate	3.47	931	0.85	0.85	1190	2.86	Aliphatic ester
Isobutyl methacrylate	3.61	940	0.37	0.38	1109	1.92	Aliphatic ester
Camphene	3.64	942	0.59	[0.57]	992	1.05*	Monoterpene
Propyl 2-methylbutyrate	3.70	945	0.02	0.03	1088	1.75	Aliphatic ester
Thuja-2,4(10)-diene	3.73	947	0.07	0.06	1050	1.45*	Monoterpene
Angelic acid	3.84	954	0.07	0.05	1710	14.73	Aliphatic acid
Methallyl methacrylate	3.90	957	1.09	1.12	1195	2.92*	Aliphatic ester
Sabinene	4.07	968	0.05	[0.06]	1050	1.45*	Monoterpene
β-Pinene	4.13	971	0.31	0.34	1035	1.33	Monoterpene
Isoamyl propionate	4.19	975	0.10				Aliphatic ester
Methallyl isobutyrate	4.38	986	0.80	0.78	1174	2.67	Aliphatic ester
Myrcene	4.41	988	0.04	0.09	1132	2.17	Monoterpene
Propyl angelate	4.56	997	0.88	[1.12]	1195	2.92*	Aliphatic ester
Isobutyl 2-methylbutyrate	4.69	1004	0.07	0.06	1136	2.23	Aliphatic ester
Isoamyl isobutyrate	4.88	1015	1.54	1.18	1142	2.30*	Aliphatic ester
2-Methylbutyl isobutyrate	4.94	1018	2.24	[2.99]	1144	2.32*	Aliphatic ester
meta-Cymene	4.98	1021	0.16	0.16	1123	2.08	Monoterpene
para-Cymene	5.09	1027	0.08	0.13	1207	3.05	Monoterpene
Limonene	5.15	1030	0.27	[1.18]	1142	2.30*	Monoterpene

Isoamyl methacrylate	5.41	1045	0.98	1.39	1220	3.21	Aliphatic ester
2-Methylbutyl methacrylate	5.43	1045	0.37	1.39	1220	3.21	Aliphatic ester
Isobutyl angelate	5.60	1055	3.83	4.10	1233	3.41*	Aliphatic ester
γ-Terpinene	5.63	1057	0.17	[1.12]	1195	2.92*	Monoterpene
Prenyl isobutyrate	5.70	1061	0.16	[0.72]	1265	3.84*	Aliphatic ester
Methallyl angelate	5.91	1071	16.27	16.63	1319	4.57	Aliphatic ester
3-Methylamyl propionate?	6.03	1078	0.52	0.51	1247	3.59	Aliphatic ester
Butyl angelate	6.31	1093	0.35	0.37	1288	4.16	Aliphatic ester
Isobutyl tiglate	6.37	1097	0.05	0.09	1300	4.33	Aliphatic ester
Isoamyl 2-methylbutyrate	6.48	1100	0.20	[4.10]	1233	3.41*	Aliphatic ester
2-Methylbutyl 2-methylbutyrate	6.54	1103	0.16	0.13	1237	3.46	Aliphatic ester
α-Thujone	6.68	1108	0.03	0.04	1365	5.25	Monoterp. ketone
Methallyl tiglate?	6.78	1112	0.18	0.15	1387	5.56	Aliphatic ester
3-Methylamyl isobutyrate	6.87	1115	10.50	10.50	1259	3.76	Aliphatic ester
α-Campholenal	7.17	1126	0.03				Monoterp. aldehyde
trans-Pinocarveol	7.62*	1143	7.46	5.74	1561	9.13	Monoterp. alcohol
3-Methylamyl methacrylate	7.62*	1143	[7.46]	1.46	1333	4.78	Aliphatic ester
Isoamyl angelate	7.71	1147	7.43	7.35	1338	4.87	Aliphatic ester
2-Methylbutyl angelate	7.81	1150	5.97	7.52	1343	4.93	Aliphatic ester
Camphene hydrate	7.97	1156	0.15	0.18	1522	7.98	Monoterp. alcohol
<i>C. nobile</i> biomarker	8.04	1159	0.77	0.69	1405	5.83	Aliphatic ester
Pinocarvone	8.13	1162	2.06	2.16	1465	6.89	Monoterp. ketone
Isoborneol	8.21	1165	0.20	0.34	1605	10.45*	Monoterp. alcohol
Isopinocampnone	8.33	1170	0.05	0.08	1489	7.34	Monoterp. alcohol
Borneol	8.58	1179	0.20	0.31	1612	10.64*	Monoterp. alcohol
Terpinen-4-ol	8.69	1183	0.03	0.02	1546	8.70	Monoterp. alcohol
Prenyl angelate	9.18	1199	0.83	19.69	1448	6.57*	Aliphatic ester
Myrtenal	9.34*	1203	1.22	0.82	1526	8.11*	Monoterp. aldehyde
Isoamyl tiglate	9.34*	1203	[1.22]	0.12	1410	5.91	Aliphatic ester
Myrtenol	9.34*	1203	[1.22]	0.59	1697	14.18	Monoterp. alcohol
3-Methylamyl valerate	9.41*	1205	0.40	0.06	1388	5.58	Aliphatic ester
α-Terpineol	9.41*	1205	[0.40]	0.28	1619	10.87	Monoterp. alcohol
Verbenone	9.68	1211	0.13	[0.34]	1605	10.45*	Monoterp. ketone
3-Methylamyl angelate	11.52*	1252	19.87	[19.69]	1448	6.57*	Aliphatic ester
Linalyl acetate	11.52*	1252	[19.87]	0.12	1516	7.85	Monoterp. ester
Isoamyl 3-hydroxy-2-methylenebutyrate	13.48	1295	0.21	0.19	1816	20.65	Aliphatic ester
Geranyl formate	13.83	1301	0.12	0.11	1651	12.16	Monoterp. ester
α-Copaene	17.42	1356	0.04	0.04	1427	6.19	Sesquiterpene
β-Caryophyllene	20.21	1398	0.27	[0.82]	1526	8.11*	Sesquiterpene
Phenylethyl isobutyrate	20.88	1406	0.11	0.08	1803	19.85	Phenolic ester
trans-β-Farnesene	24.17	1446	0.29	[0.31]	1612	10.64*	Sesquiterpene

Germacrene D	25.20	1458	0.02	0.06	1630	11.25*	Sesquiterpene
β -Selinene	25.80	1465	0.10	[0.06]	1630	11.25*	Sesquiterpene
(<i>E,E</i>)- α -Farnesene	28.71	1500	0.04	0.03	1687	13.72	Sesquiterpene
Copaborneol	35.60	1595	0.10				Sesquiterp. alcohol
Total identified			97.60%	96.42%			

*: 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 : 1.4435 \pm 0.0003 (20 °C)

CONCLUSION

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



