

**Date :** July 6, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17F29-PTH1-1-DM

**Customer identification :** Germain Chamomille Organic - Egypt - CC110175R

**Type :** Essential oil

**Source :** *Matricaria recutita*

**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 :** 2017-07-03

Checked and approved by :



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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.	
Isovaleral	0.67	674	0.04	0.08	758	0.58*	Aliphatic aldehyde
2-Methylbutyral	0.70	678	0.04	[0.08]	758	0.58*	Aliphatic aldehyde
Hexanal	1.73	807	0.02	0.01	1013	1.32	Aliphatic aldehyde
Ethyl 2-methylbutyrate	2.26	849	0.14	0.13	983	1.20	Aliphatic ester
Ethyl isovalerate	2.35	856	0.01	0.02	1019	1.38	Aliphatic ester
$\alpha$ -Pinene	3.43	930	0.02	0.02	945	1.03	Monoterpene
Camphene	3.72	947	0.02	0.02	1000	1.28	Monoterpene
Propyl 2-methylbutyrate	3.77	950	0.06	0.05	1083	1.98	Aliphatic ester
Sabinene	4.15	973	0.02	0.02	1060	1.76	Monoterpene
Myrcene	4.49	993	0.02	0.01	1115	2.30	Monoterpene
2-Pentylfuran	4.54	995	0.05	0.03	1173	3.02	Furan
6-Methyl-5-hepten-2-one	4.56	997	0.06	0.04	1273	4.38	Aliphatic ketone
Yomogi alcohol	4.72	1006	0.05	0.04	1353	5.55	Monoterp. alcohol
$\alpha$ -Phellandrene	4.77	1008	0.02	0.01	1107	2.21	Monoterpene
Octanal	4.88	1015	0.07	0.06	1231	3.79*	Aliphatic aldehyde
$\alpha$ -Terpinene	4.95	1019	0.02	0.01	1122	2.37	Monoterpene
para-Cymene	5.15	1029	0.08	0.09	1205	3.43	Monoterpene
Limonene	5.18	1031	0.04	0.03	1141	2.60	Monoterpene
$\beta$ -Phellandrene	5.21	1033	tr	0.02	1144	2.65*	Monoterpene
1,8-Cineole	5.25	1035	0.02	[0.02]	1144	2.65*	Monoterp. ether
cis- $\beta$ -Ocimene	5.37	1041	0.06	0.18	1186	3.19*	Monoterpene
Butyl 2-methylbutyrate	5.48	1047	0.01	[0.18]	1186	3.19*	Aliphatic ester
trans- $\beta$ -Ocimene	5.55	1051	0.34	0.29	1199	3.36	Monoterpene
$\gamma$ -Terpinene	5.74	1061	0.14	[0.18]	1186	3.19*	Monoterpene
Artemisia ketone	5.80	1065	0.33	0.31	1287	4.57	Monoterp. ketone
Artemisia alcohol	6.22*	1088	0.13	0.11	1447	7.13	Monoterp. alcohol
Terpinolene	6.22*	1088	[0.13]	[0.06]	1231	3.79*	Monoterpene
Nonanal	6.79	1113	0.12	0.10	1337	5.31	Aliphatic aldehyde
Artemisyl acetate	8.31	1168	0.01	0.02	1367	5.78	Monoterp. ester
Borneol	8.62	1180	0.07	18.54	1628	12.54*	Monoterp. alcohol
Terpinen-4-ol	8.81	1186	0.01	0.13	1528	9.03*	Monoterp. alcohol
$\alpha$ -Terpineol	9.48	1207	0.07	[18.54]	1628	12.54*	Monoterp. alcohol
(Z)-Hex-3-en-1-yl isovalerate	10.70	1234	0.01	0.02	1437	6.88	Aliphatic ester
Hexyl isovalerate	10.88	1238	0.03	0.03	1407	6.40	Aliphatic ester
(E)-Hex-2-en-1-yl isovalerate	11.35	1248	0.03	0.04	1463	7.52	Aliphatic ester
Geranial	12.54	1275	0.04	0.03	1659	13.92	Monoterp. aldehyde
Pelargonic acid	14.18	1307	0.05	0.08	2115	38.88	Fatty acid
Modheph-2-ene	17.75	1362	0.03	0.04	1439	6.93	Sesquiterpene
$\alpha$ -Isocomene	17.92	1364	0.01	0.01	1457	7.36	Sesquiterpene

β-Elemene	18.98	1380	0.09	[0.13]	1528	9.03*	Sesquiterpene
Benzyl isovalerate	19.62	1390	0.06	0.99	1807	22.33*	Phenolic ester
β-Caryophyllene	20.65	1405	0.10	0.07	1523	8.90	Sesquiterpene
Capric acid	21.57	1416	0.76	1.12	2203	41.36	Fatty acid
Aromadendrene	22.05	1421	0.07	0.04	1537	9.26	Sesquiterpene
allo-Aromadendrene	23.71	1441	0.09	0.10	1565	10.25	Sesquiterpene
<i>trans</i> -β-Farnesene	24.90	1456	18.16	[18.54]	1628	12.54*	Sesquiterpene
γ-Murolene	25.40	1462	0.17	0.12	1613	11.99	Sesquiterpene
Germacrene D	25.76	1466	1.38	[18.54]	1628	12.54*	Sesquiterpene
β-Selinene	26.34	1473	0.15	[18.54]	1628	12.54*	Sesquiterpene
α-Curcumene	26.54	1475	0.12	0.74	1696	15.82*	Sesquiterpene
α-Selinene	26.96*	1480	0.89	0.73	1631	12.65	Sesquiterpene
Bicyclgermacrene	26.96*	1480	[0.89]	0.11	1635	12.78	Sesquiterpene
α-Murolene	27.72	1490	0.07	0.99	1650	13.43*	Sesquiterpene
( <i>Z,E</i> )-α-Farnesene	27.87	1491	0.14	0.35	1678	14.87*	Sesquiterpene
γ-Cadinene	28.76	1502	0.17	0.14	1673	14.63	Sesquiterpene
β-Bisabolene	28.93	1505	0.07	[0.99]	1650	13.43*	Sesquiterpene
1,9-Dihydrochamazulene	29.22*	1509	1.81	[0.99]	1807	22.33*	Azulene
( <i>E,E</i> )-α-Farnesene	29.22*	1509	[1.81]	[0.74]	1696	15.82*	Sesquiterpene
δ-Cadinene	29.44	1512	0.25	[0.35]	1678	14.87*	Sesquiterpene
( <i>E</i> )-Nerolidol	33.98*	1575	0.75	0.08	1996	34.39	Sesquiterp. alcohol
Spathulenol	33.98*	1575	[0.75]	5.98	2029	35.81*	Sesquiterp. alcohol
Dendrolasin	34.16	1578	0.12	0.07	1876	26.97	Sesquiterp. ether
Viridiflorol	34.39	1581	0.16	0.11	1993	34.23	Sesquiterp. alcohol
MARE I	36.27	1612	0.12	0.20	1917	29.83	Oxygenated sesquiterpene
5,6-Dihydrochamazulene	36.58	1620	0.31	0.27	1971	33.29	Azulene
Isospathulenol	36.84	1626	0.08	1.60	2137	39.56*	Sesquiterp. alcohol
Bisabolol oxide isomer I	36.92	1628	0.39				Sesquiterp. alcohol
τ-Cadinol	37.49	1642	0.11	0.11	2066	37.41	Sesquiterp. alcohol
7,8-Dihydrochamazulene	37.60	1645	0.67	0.52	2015	35.21	Azulene
α-Murolol	37.70	1647	0.19	0.17	2097	38.32	Sesquiterp. alcohol
α-Cadinol	37.98*	1654	5.82	0.27	2129	39.32	Sesquiterp. alcohol
α-Bisabolol oxide B	37.98*	1654	[5.82]	[5.98]	2029	35.81*	Sesquiterp. alcohol
Bisabolol oxide isomer II	38.18	1659	0.70				Sesquiterp. alcohol
α-Bisabolone oxide	39.05	1680	4.69	4.96	2052	36.82	Sesquiterp. alcohol
α-Bisabolol	39.50	1691	1.65	[1.60]	2137	39.56*	Sesquiterp. alcohol
Chamazulene	40.66	1726	2.94	3.01	2235	42.20	Azulene
α-Bisabolol oxide A	41.76	1760	43.64	44.75	2312	44.01*	Sesquiterp. alcohol
<i>M. recutita</i> biomarker	42.96	1798	0.21	0.15	2212	41.62	
Phytone	44.44	1852	0.34	0.34	2092	38.16	Aliphatic ketone
<i>cis</i> -Spiroether	45.70	1898	4.47	4.38	2740	52.50	Polyyne
<i>trans</i> -Spiroether	46.27	1920	0.62				Polyyne
( <i>Z</i> )-Tibetin spiroether	47.34	1963	0.14				Polyyne

Phytol	50.60	2102	0.15	0.16	2573	49.43	Diterp. alcohol
Tricosane	55.02	2309	0.30	[44.75]	2312	44.01*	Alkane
Pentacosane	58.98	2511	0.81	1.05	2541	48.80	Alkane
<b>Total identified</b>	<b>96.22%</b>			<b>94.3%</b>			

\*: 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

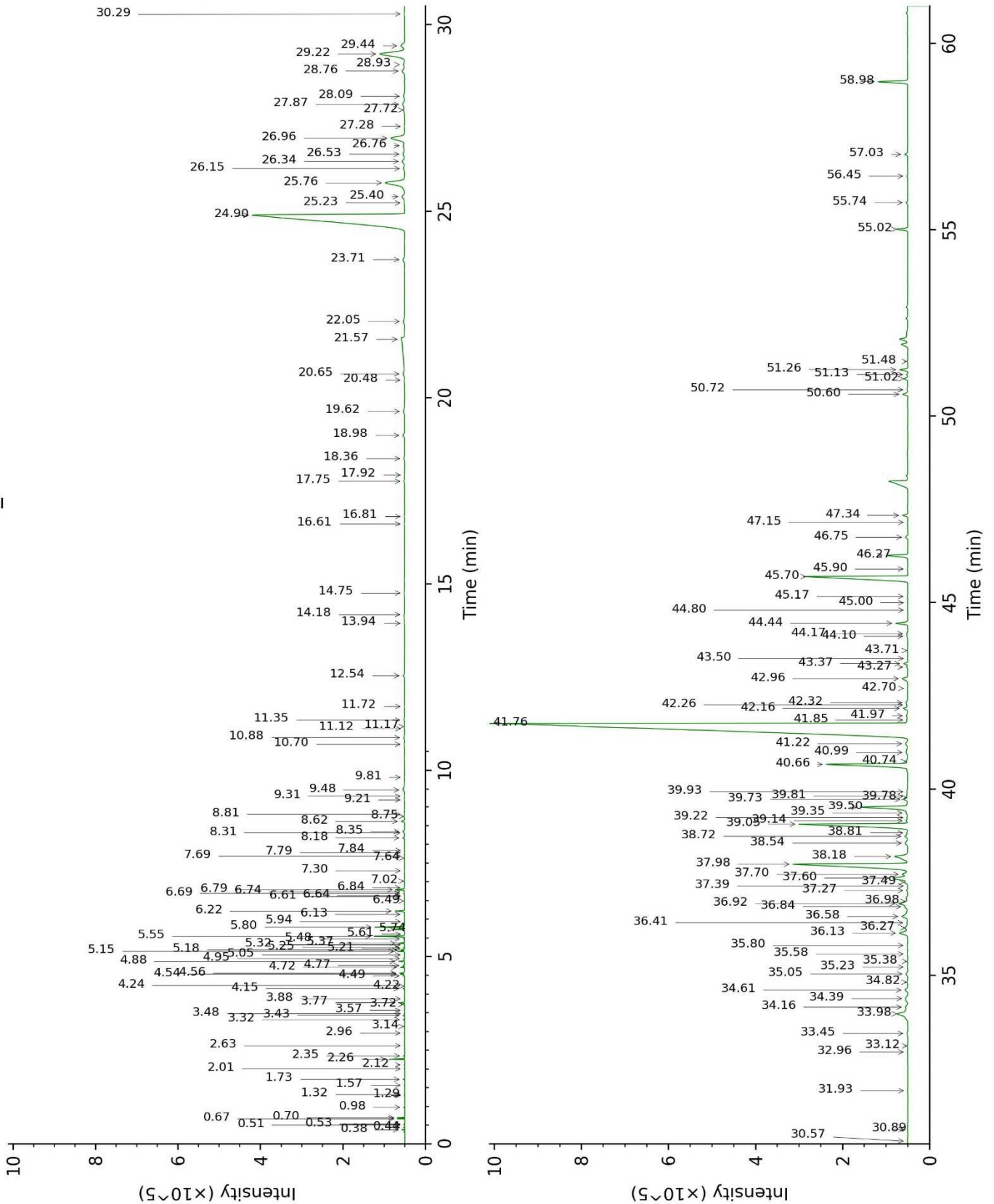
**Physical aspect :** Dark blue liquid

**Refractive index :** N/A (too dark)

#### CONCLUSION

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

17F29-PTH1-1-DM\_BP5



17F29-PTH1-1-DM\_WAX

