PLANT THERAPY
100% PURE ESSENTIAL OILS

GC/MS BATCH NUMBER: R50103

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

KEY CONSTITUENTS PRESENT IN THIS BATCH OF ORGANIC ROSEMARY OIL	%
1,8-CINEOLE	47.5
CAMPHOR	10.9
α-PINENE	10.7
β-PINENE	6.8
β-CARYOPHYLLENE	4.2
CAMPHENE	4.0
BORNEOL	2.8
α-TERPINEOL	1.9
MYRCENE	1.4
LIMONENE	1.3
para-CYMENE	1.3
BORNYL ACETATE	0.9
LINALOOL	0.8

Comments from Robert Tisserand: Nice fresh, green odor. Very slightly low on 1 of 13 key ISO constituents (limonene) but this is not a concern.

Date : March 11, 2016

SAMPLE IDENTIFICATION

Internal code : 16C01-PTH3-1-HM
Customer identification : Organic Rosemary - Tunisia - R5010356R
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 : 2016-03-07

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.	
cis-Hex-3-en-1-ol	2.01	865	0.02	0.01	1342	5.08	Aliphatic alcohol
Tricyclene	2.62	912	0.15	0.14	920	0.85	Monoterpene
α-Thujene	2.72	918	0.27	0.34	959	0.97	Monoterpene
α-Pinene	2.83	925	10.69	10.50	952	0.95	Monoterpene
Camphene	3.08*	941	4.09	3.97	1014	1.18	Monoterpene
α-Fenchene	3.08*	941	[4.09]	0.07	1006	1.12	Monoterpene
Thuja-2,4(10)-diene	3.16	946	0.02	0.13	1069	1.62*	Monoterpene
Sabinene	3.50	967	0.07	[0.13]	1069	1.62*	Monoterpene
β-Pinene	3.55	971	6.77	6.76	1053	1.50	Monoterpene
Myrcene	3.85	990	1.36	1.36	1121	2.14	Monoterpene
Octan-3-one	3.89	992	0.05	0.05	1206	3.15	Aliphatic ketone
α-Phellandrene	4.08*	1004	0.37	0.17	1114	2.05	Monoterpene
Δ3-Carene	4.08*	1004	[0.37]	0.21	1100	1.89	Monoterpene
α-Terpinene	4.27	1015	0.46	0.43	1127	2.21	Monoterpene
1,8-Cineole	4.62*	1034	49.92	47.54	1162	2.62	Monoterp. ether
Limonene	4.62*	1034	[49.92]	1.32	1149	2.47	Monoterpene
para-Cymene	4.62*	1034	[49.92]	1.27	1214	3.27	Monoterpene
cis-β-Ocimene	4.70	1039	0.03	0.84	1195	3.01*	Monoterpene
trans-β-Ocimene	4.86	1048	0.03	0.03	1208	3.17	Monoterpene
γ-Terpinene	5.03	1058	0.80	[0.84]	1195	3.01*	Monoterpene
cis-Sabinene hydrate	5.38	1078	0.12	0.12	1416	6.23	Monoterp. alcohol
Terpinolene	5.48	1083	0.37	0.38	1227	3.45	Monoterpene
Fenchone	5.60	1090	0.01	0.01	1326	4.85	Monoterp. ketone
para-Cymenene	5.71	1096	0.03	0.03	1373	5.55	Monoterpene
trans-Sabinene hydrate	5.96	1107	0.04	0.06	1492	7.68	Monoterp. alcohol
Linalool	6.01	1109	0.84	0.84	1507	7.95	Monoterp. alcohol
endo-Fenchol	6.37	1126	0.05	0.04	1527	8.56	Monoterp. alcohol
Camphor	6.79	1145	10.88	10.96	1431	6.52*	Monoterp. ketone
Camphene hydrate	7.00	1154	0.04	0.04	1529	8.63	Monoterp. alcohol
Pinocarvone	7.10	1159	0.01	0.02	1486	7.55	Monoterp. ketone
Borneol	7.54	1179	2.82	2.58	1628	11.88	Monoterp. alcohol
Terpinen-4-ol	7.64	1184	0.88	0.79	1535	8.81	Monoterp. alcohol
α-Terpineol	8.25	1205	1.91	1.93	1633	12.12	Monoterp. alcohol
Bornyl acetate	10.90	1276	0.87	0.83	1511	8.07	Monoterp. ester
Carvacrol	13.44	1327	0.03	0.02	2150	39.47	Monoterp. alcohol
Citronellyl acetate	14.49	1345	0.06	0.19	1612	11.19*	Monoterp. ester
α-Copaene	14.89	1352	0.22	[10.96]	1431	6.52*	Sesquiterpene
β-Caryophyllene	17.49	1397	4.23	4.17	1523	8.45	Sesquiterpene
α-Humulene	19.92	1429	0.44	0.48	1583	10.25	Sesquiterpene
γ-Muurolene	21.84	1454	0.16	[0.19]	1612	11.19*	Sesquiterpene
α-Muurolene	23.89	1481	0.04	0.04	1645	12.63	Sesquiterpene

γ-Cadinene	24.84	1493	0.09	0.10	1667	13.63	Sesquiterpene
β-Bisabolene	25.02	1495	0.07	0.06	1657	13.21	Sesquiterpene
δ-Cadinene	25.46	1500	0.24	0.22	1673	13.92	Sesquiterpene
Caryophyllene oxide	30.19	1556	0.11	0.11	1847	24.13	Sesquiterp. ether
Total identified			**99.66%**	**99.16%**			

*: 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 : 1.4670 ± 0.0003 (20 °C)

Conclusion

No adulterant, contaminant or diluent were detected using this method. This sample is of the 1,8-cineole chemotype.

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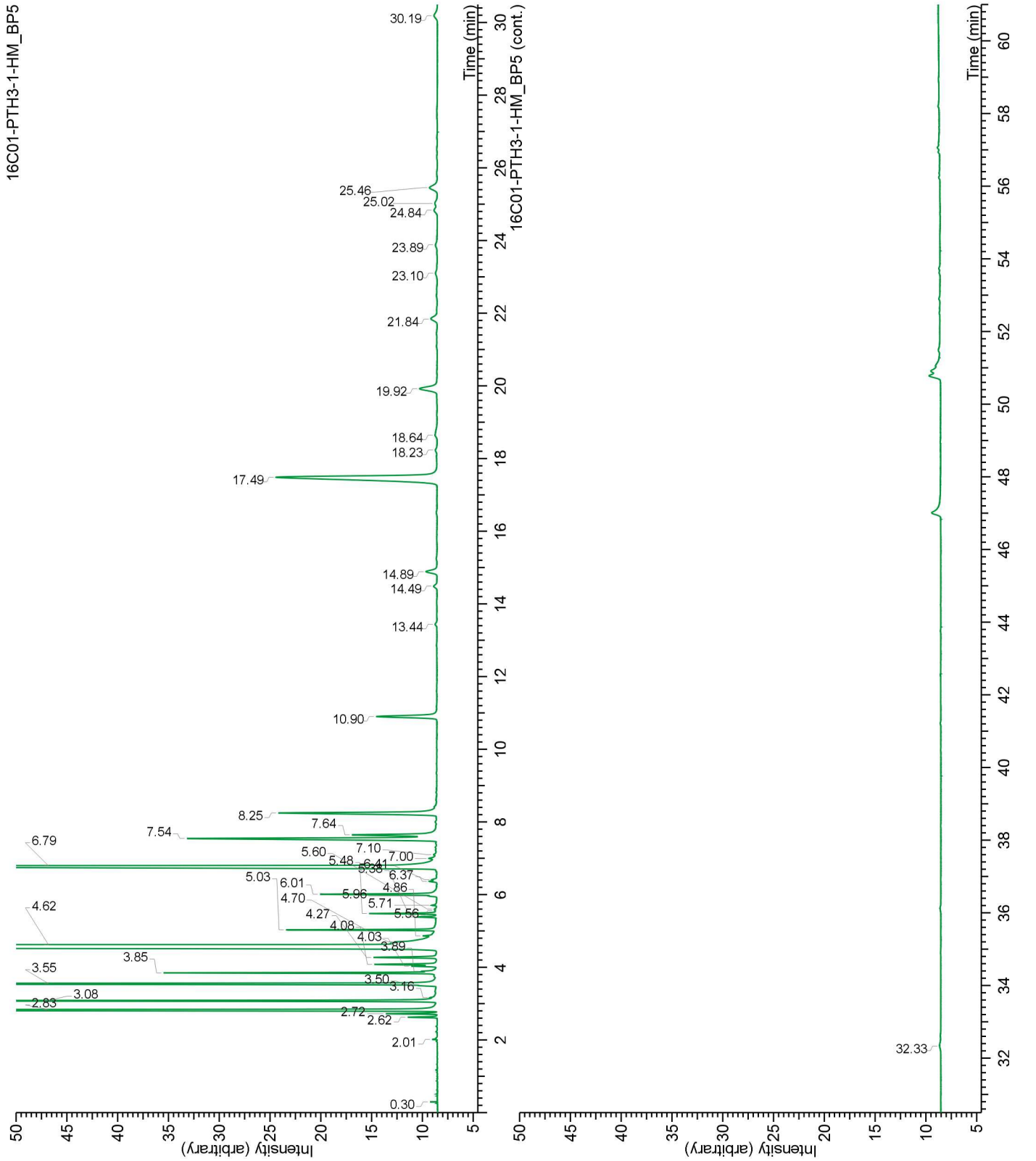
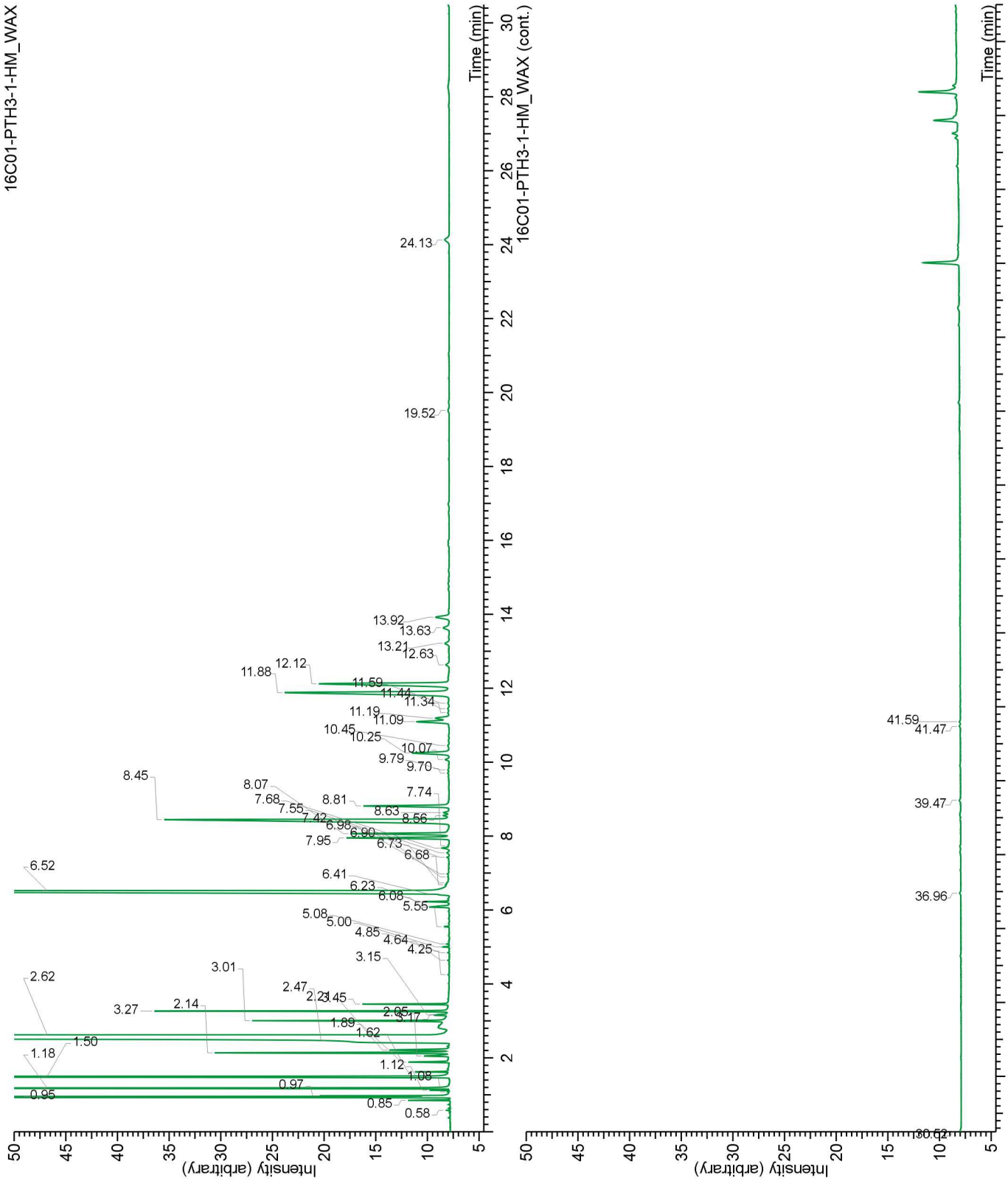

16C01-PTH3-1-HM_BP5
Time (min)
Intensity (arbitrary)
30.19
25.46
25.02
24.84
23.89
23.10
21.84
19.92
18.64
18.23
17.49
14.89
14.49
13.44
10.90
8.25
7.64
7.54
6.79
7.10
7.00
5.60
5.48
6.41
5.38
6.37
5.03
6.01
4.86
4.70
5.96
5.71
4.62
4.27
5.56
4.08
4.03
3.89
3.85
3.55
3.50
3.16
3.08
2.83
2.72
2.62
2.01
0.30
16C01-PTH3-1-HM_BP5 (cont.)
Time (min)
Intensity (arbitrary)
32.33


16C01-PTH3-1-HM_WAX
Time (min)
Intensity (arbitrary)
24.13
19.52
13.92
13.63
13.21
12.63
12.12
11.88
11.59
11.44
11.34
11.19
11.09
10.45
10.25
10.07
9.79
9.70
8.45
8.07
7.74
7.68
8.81
7.55
8.63
8.56
7.42
6.98
6.90
7.95
6.73
6.68
6.52
6.41
6.23
6.08
5.55
5.08
5.00
4.85
4.64
4.25
3.15
3.01
2.62
2.47
2.23
3.45
3.27
2.14
2.05
3.17
1.89
1.62
1.50
1.18
1.12
1.08
0.97
0.95
0.85
0.58
16C01-PTH3-1-HM_WAX (cont.)
Time (min)
Intensity (arbitrary)
41.59
41.47
39.47
36.96
30.52