

Date : February 22, 2018

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 18B20-HBN1-1-CC

Customer identification : Allspice - 69598

Type : Essential oil

Source : *Pimenta officinalis*

Customer : Health & Beauty Natural Oils

ANALYSIS

Method: PC-PA-014-17J19 - Analysis of the composition of an essential oil, or other volatile liquid, by FAST GC-FID (in French); identifications validated by GC-MS.

Analyst : Sylvain Mercier, M. Sc., Chimiste

Analysis date : February 21, 2018

Checked and approved by :

Alexis St-Gelais, M. Sc., chimiste 2013-174

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PHYSICOCHEMICAL DATA

Physical aspect: Light yellow liquid

Refractive index: 1.5325 ± 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method.

ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
(3Z)-Hexenol	tr	0.01	Aliphatic alcohol
α -Thujene	0.02	0.02	Monoterpene
α -Pinene	0.04	0.04	Monoterpene
β -Pinene	0.01	tr	Monoterpene
Myrcene	0.05	0.05	Monoterpene
α -Phellandrene	0.14	0.14	Monoterpene
Δ^3 -Carene	0.01	0.01	Monoterpene
α -Terpinene	0.03	0.03	Monoterpene
para-Cymene	0.12	0.12	Monoterpene
Limonene	0.38*	0.07	Monoterpene
1,8-Cineole	[0.38]*	0.32	Monoterpenic ether
(Z)- β -Ocimene	0.01	0.01	Monoterpene
(E)- β -Ocimene	0.25	0.25	Monoterpene
γ -Terpinene	0.08	0.07	Monoterpene
cis-Linalool oxide (fur.)	tr	tr	Monoterpenic alcohol
Terpinolene	0.18	0.18	Monoterpene
trans-Linalool oxide (fur.)	0.02	tr	Monoterpenic alcohol
Linalool	0.06	0.06	Monoterpenic alcohol
Terpinen-4-ol	0.10	0.18*	Monoterpenic alcohol
para-Cymen-8-ol	0.01	0.02	Monoterpenic alcohol
α -Terpineol	0.10	0.10	Monoterpenic alcohol
Methylchavicol	0.03	1.27*	Phenylpropanoid
Chavicol	0.05	0.06	Phenylpropanoid
Eugenol	75.64	75.54	Phenylpropanoid
β -Elemene	0.49	5.65*	Sesquiterpene
α -Gurjunene	0.17	0.17	Sesquiterpene
Methyleugenol	10.03	10.06	Phenylpropanoid
β -Caryophyllene	5.22	[5.65]*	Sesquiterpene
Aromadendrene	0.08	[0.18]*	Sesquiterpene
α -Humulene	1.26	[1.27]*	Sesquiterpene
allo-Aromadendrene	0.35	0.33	Sesquiterpene
Selina-4,11-diene	0.32	0.30	Sesquiterpene
β -Selinene	0.66	0.67	Sesquiterpene
Viridiflorene	1.09*	0.23	Sesquiterpene
α -Selinene	[1.09]*	0.85	Sesquiterpene
α -Muurolene	0.08	0.07	Sesquiterpene
γ -Cadinene	0.09	0.10	Sesquiterpene
trans-Calamenene	0.31*	0.02	Sesquiterpene
δ -Cadinene	[0.31]*	0.28*	Sesquiterpene
Zonarene	[0.31]*	[0.28]*	Sesquiterpene
Spathulenol	0.02	0.02	Sesquiterpenic alcohol
Caryophyllene oxide	0.07	0.06	Sesquiterpenic ether
Globulol	0.13	0.13	Sesquiterpenic alcohol
Viridiflorol	0.07	0.08	Sesquiterpenic alcohol
Eudesm-5-en-11-ol	0.08	0.06	Sesquiterpenic alcohol
Methoxyeugenol	0.02	0.03	Phenylpropanoid
Unknown	0.15	0.13	Oxygenated sesquiterpene
τ -Cadinol	0.10	0.12	Sesquiterpenic alcohol

Selin-11-en-4 α -ol	0.31	0.29	Sesquiterpenic alcohol
α -Cadinol	0.09	0.09	Sesquiterpenic alcohol
Total identified	98.37%	98.17%	

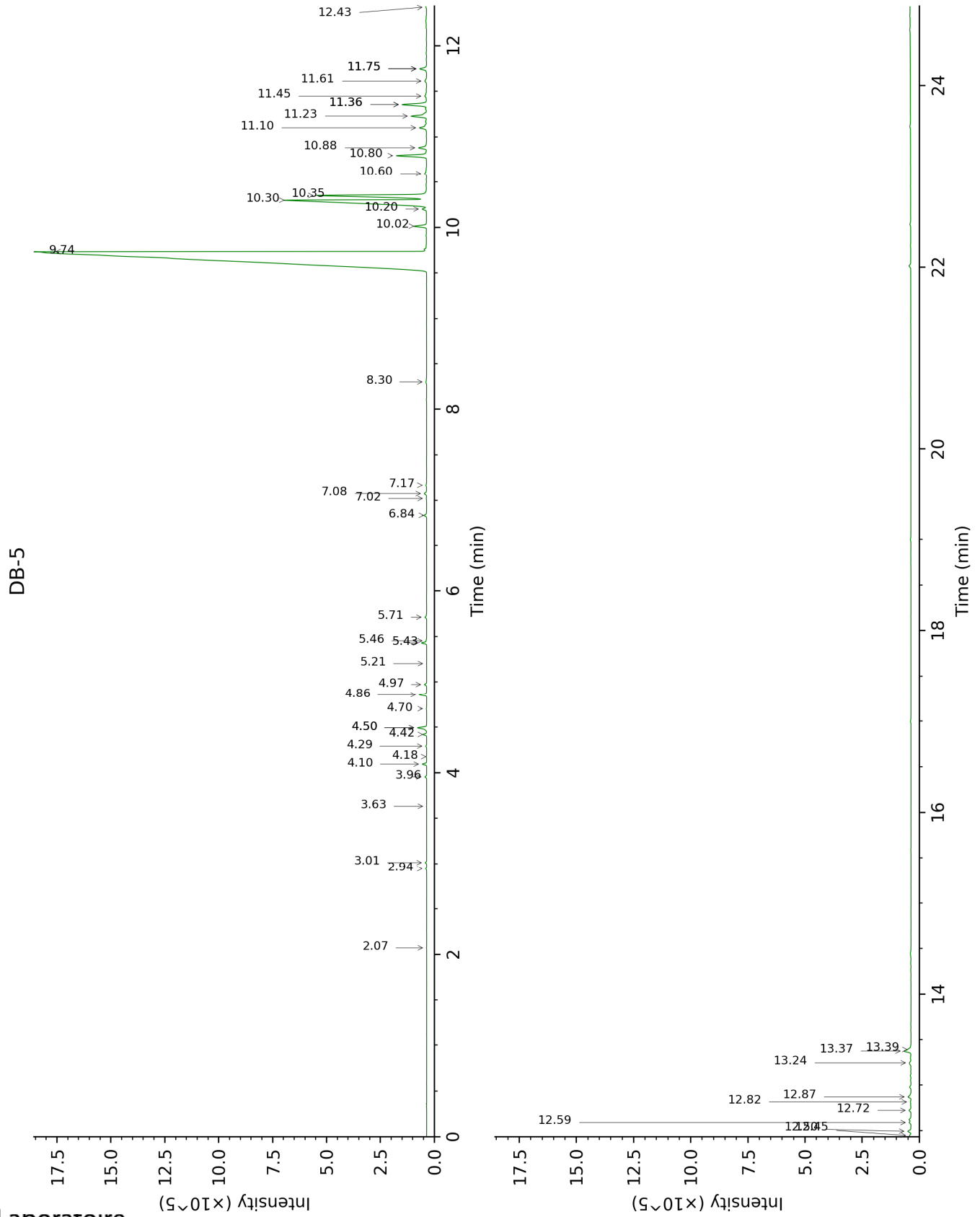
*: Two or more compounds are coeluting on this column

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

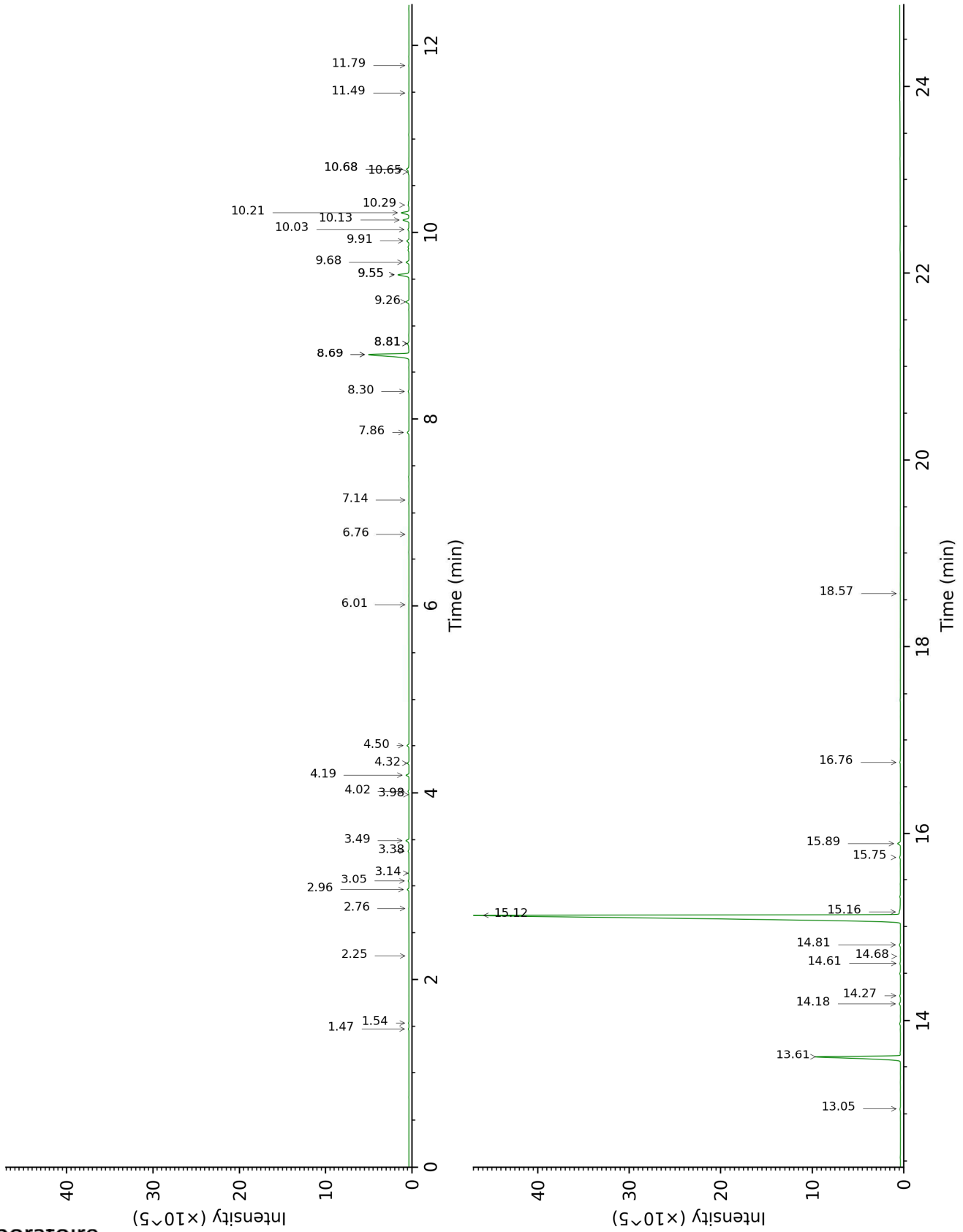
tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

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DB-WAX



FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
(3Z)-Hexenol	2.07	853	tr	6.01	1349	0.01
α -Thujene	2.94	921	0.02	1.54	1002	0.02
α -Pinene	3.01	925	0.04	1.47	995	0.04
β -Pinene	3.63	966	0.01	2.25	1069	tr
Myrcene	3.96	988	0.05	3.05	1134	0.05
α -Phellandrene	4.10	997	0.14	2.96	1128	0.14
Δ^3 -Carene	4.18	1002	0.01	2.76	1112	0.01
α -Terpinene	4.29	1010	0.03	3.14	1141	0.03
para-Cymene	4.42	1018	0.12	4.32	1228	0.12
Limonene	4.50*	1022	0.38	3.38	1159	0.07
1,8-Cineole	4.50*	1022	[0.38]	3.49	1168	0.32
(Z)- β -Ocimene	4.70	1036	0.01	3.98	1204	0.01
(E)- β -Ocimene	4.86	1045	0.25	4.19	1219	0.25
γ -Terpinene	4.98	1053	0.08	4.02	1207	0.07
<i>cis</i> -Linalool oxide (fur.)	5.20	1067	tr	6.76	1402	tr
Terpinolene	5.43	1081	0.18	4.50	1241	0.18
<i>trans</i> -Linalool oxide (fur.)	5.46	1083	0.02	7.14	1430	tr
Linalool	5.71	1099	0.06	8.30	1516	0.06
Terpinen-4-ol	6.84	1171	0.10	8.82*	1556	0.18
para-Cymen-8-ol	7.02	1182	0.01	11.79	1799	0.02
α -Terpineol	7.08	1186	0.10	10.03	1652	0.10
Methylchavicol	7.17	1192	0.03	9.55*	1614	1.27
Chavicol	8.30	1267	0.05	16.76	2274	0.06
Eugenol	9.74	1366	75.64	15.12	2107	75.54
β -Elemene	10.02	1386	0.49	8.69*	1547	5.65
α -Gurjunene	10.20	1399	0.17	7.86	1483	0.17
Methyleugenol	10.30	1406	10.03	13.61	1962	10.06
β -Caryophyllene	10.35	1410	5.22	8.69*	1547	[5.65]
Aromadendrene	10.60	1428	0.08	8.82*	1556	[0.18]
α -Humulene	10.80	1443	1.26	9.55*	1614	[1.27]
allo- Aromadendrene	10.88	1449	0.35	9.26	1590	0.33
Selina-4,11- diene	11.10	1466	0.32	9.68	1624	0.30
β -Selinene	11.23	1475	0.66	10.13	1661	0.67
Viridiflorene	11.36*	1485	1.09	9.91	1643	0.23
α -Selinene	11.36*	1485	[1.09]	10.21	1667	0.85
α -Muurolene	11.45	1491	0.08	10.29	1674	0.07
γ -Cadinene	11.61	1504	0.09	10.65	1703	0.10
<i>trans</i> - Calamenene	11.75*	1514	0.31	11.50	1774	0.02
δ -Cadinene	11.75*	1514	[0.31]	10.68*	1706	0.28
Zonarene	11.75*	1514	[0.31]	10.68*	1706	[0.28]
Spathulenol	12.43	1568	0.02	14.68	2064	0.02
Caryophyllene oxide	12.45	1569	0.07	13.06	1912	0.06

Globulol	12.50	1573	0.13	14.18	2016	0.13
Viridiflorol	12.59	1580	0.07	14.26	2024	0.08
Eudesm-5-en-11-ol	12.72	1591	0.08	14.61	2057	0.06
Methoxyeugenol	12.82	1598	0.02	18.57	2470	0.03
Unknown [m/z 43, 81 (97), 135 (71), 95 (62), 204 (61), 71 (59), 207 (56)... 222 (3)]	12.87	1602	0.15	14.81	2076	0.13
τ -Cadinol	13.24	1633	0.10	15.16	2111	0.12
Selin-11-en-4 α -ol	13.37	1644	0.31	15.90	2184	0.29
α -Cadinol	13.39	1645	0.09	15.75	2169	0.09
Total identified	98.37%			98.17%		
Total reported	98.52%			98.30%		

*: Two or more compounds are coeluting on this column

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

tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

R.T.: Retention time (minutes)

R.I.: Retention index