

Date: August 11, 2017

SAMPLE /DENT/FICAT/ON

Internal code: 17H03-NG1-1-DM

Customer identification: HE Picea Mariana - B-PIMACAN06RC

Type: Essential oil

Source : *Picea mariana*

Customer: Nature's Gift

ANALYSIS

Method: PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

Identifications double-checked by GC-MS

Analyst: Sylvain Mercier, M.Sc., chimiste

Analysis date: 2017-08-11

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.	
Toluene	1.32	759	tr	14.87	957	1.27*	Simple phenolic
Hexanal	1.72	806	0.01	0.01	1014	1.68	Aliphatic aldehyde
cis-Hex-3-en-1-ol	2.48	864	0.09	0.08	1330	5.72	Aliphatic alcohol
Santene	2.63	875	2.97	2.91	891	1.00	Normonoterpene
Hexanol	2.72	882	0.04	0.04	1304	5.32	Aliphatic alcohol
Tricyclene	3.24	916	2.15	2.18	924	1.13	Monoterpene
α -Thujene	3.32	921	0.15	0.20	963	1.29	Monoterpene
α -Pinene	3.46	929	15.25	[14.87]	957	1.27*	Monoterpene
Camphene	3.75*	946	20.40	20.03	1002	1.59	Monoterpene
α -Fenchene	3.75*	946	[20.40]	0.07	989	1.49	Monoterpene
Thuja-2,4(10)-diene	3.81	950	0.02	0.15	1062	2.10*	Monoterpene
Sabinene	4.15	969	0.15	[0.15]	1062	2.10*	Monoterpene
β -Pinene	4.22	973	3.41	3.32	1044	1.94	Monoterpene
Myrcene	4.50	990	4.24	4.16	1119	2.71	Monoterpene
Δ^3 -Carene	4.79*	1006	7.45	7.02	1098	2.44	Monoterpene
α -Phellandrene	4.79*	1006	[7.45]	0.28	1110	2.60	Monoterpene
cis-Hex-3-en-1-yl acetate	4.85	1010	0.02	0.04	1259	4.63	Aliphatic ester
α -Terpinene	4.95	1015	0.18	0.18	1124	2.79	Monoterpene
para-Cymene	5.15	1026	0.19	0.24	1213	3.96	Monoterpene
Limonene	5.19	1028	3.81	3.64	1143	3.04	Monoterpene
β -Phellandrene	5.22	1030	0.94	1.05	1149	3.11	Monoterpene
1,8-Cineole	5.24	1031	0.52	0.44	1148	3.10	Monoterp. ether
cis- β -Ocimene	5.36	1037	0.02	0.23	1194	3.67*	Monoterpene
trans- β -Ocimene	5.54	1047	0.02	0.02	1206	3.85	Monoterpene
γ -Terpinene	5.73	1057	0.21	[0.23]	1194	3.67*	Monoterpene
<i>P. mariana</i> biomarker	6.01	1073	0.04	0.04	1454	8.18	Monoterp. alcohol
Isoterpinolene	6.12	1079	0.04	0.03	1224	4.11	Monoterpene
Terpinolene	6.21	1084	0.97	0.93	1228	4.18	Monoterpene
Fenchone	6.36	1092	0.01	0.02	1321	5.60	Monoterp. ketone
para-Cymenene	6.42	1095	0.10	0.08	1371	6.39	Monoterpene
γ -Campholenal	6.46	1097	0.08				Monoterp. aldehyde
Linalool	6.69	1106	0.27	0.27	1501	9.42	Monoterp. alcohol
endo-Fenchol	7.14	1122	0.03	0.03	1518	10.04	Monoterp. alcohol
α -Campholenal	7.25	1126	0.14				Monoterp. aldehyde
trans-Pinocarveol	7.60	1139	0.09	0.39	1572	12.04*	Monoterp. alcohol
Camphor	7.76	1145	0.10	0.10	1426	7.50	Monoterp. ketone
Camphene hydrate	8.02	1154	0.50	0.73	1521	10.15*	Monoterp. alcohol
Isoborneol	8.30	1164	0.08	0.09	1590	12.74	Monoterp. alcohol
Isopinocampone	8.48	1171	0.06	0.05	1498	9.31	Monoterp. alcohol
Borneol	8.63	1176	0.87	0.96	1620	14.21*	Monoterp. alcohol
Terpinen-4-ol	8.79	1182	0.30	0.30	1529	10.44*	Monoterp. alcohol

α -Terpineol	9.46	1203	0.46	0.50	1624	14.39*	Monoterp. alcohol
endo-Fenchyl acetate	9.87	1212	0.44	0.40	1405	7.02	Monoterp. ester
Thymol methyl ether	10.62	1229	0.03	[0.30]	1529	10.44*	Monoterp. ether
Citronellol	10.89	1234	0.08	0.06	1716	19.55	Monoterp. alcohol
Piperitone	11.80	1254	0.03	0.03	1631	14.79	Monoterp. ketone
Geraniol	11.97	1258	0.03	0.03	1782	24.02	Monoterp. alcohol
cis-Verbenyl acetate	12.73	1275	0.16				Monoterp. ester
Bornyl acetate	13.12*	1283	28.27	29.34	1513	9.83*	Monoterp. ester
trans-Verbenyl acetate	13.12*	1283	[28.27]				Monoterp. ester
Isobornyl acetate	13.15	1284	0.36	[29.34]	1513	9.83*	Monoterp. ester
trans-Pinocarvyl acetate	13.55	1293	0.18	0.17	1538	10.77	Monoterp. ester
<i>P. mariana</i> biomarker	13.61	1294	0.13	[0.39]	1572	12.04*	Monoterp. ester
α -Cubebene	15.91	1330	0.13	0.18	1415	7.27	Sesquiterpene
exo-2-Hydroxycineole acetate	16.04	1332	0.07				Monoterp. ester
α -Terpinyl acetate	16.64	1341	0.07	[0.96]	1620	14.21*	Monoterp. ester
Citronellyl acetate	17.23	1350	0.11	0.09	1605	13.39	Monoterp. ester
α -Copaene	17.70	1357	0.02	0.02	1431	7.64	Sesquiterpene
β -Elemene	18.92	1375	0.06	[0.73]	1521	10.15*	Sesquiterpene
Geranyl acetate	19.33	1382	0.20	0.30	1694	18.08*	Monoterp. ester
Longifolene	19.65	1386	0.08	0.09	1491	9.09	Sesquiterpene
β -Caryophyllene	20.58	1400	0.19	[0.73]	1521	10.15*	Sesquiterpene
α -Humulene	23.37	1433	0.06	0.06	1584	12.50	Sesquiterpene
trans-Cadina-1(6),4-diene	25.04	1453	0.06	0.05	1583	12.46	Sesquiterpene
γ -Muurolene	25.44	1458	0.11	0.21	1610	13.68	Sesquiterpene
Germacrene D	25.59	1460	0.05	[0.96]	1620	14.21*	Sesquiterpene
β -Selinene	26.38	1469	0.03	[0.50]	1624	14.39*	Sesquiterpene
α -Muurolene	27.62	1484	0.26	0.23	1643	15.45	Sesquiterpene
γ -Cadinene	28.67	1496	0.22	0.23	1667	16.71	Sesquiterpene
β -Bisabolene	29.10	1502	0.05	0.05	1658	16.23	Sesquiterpene
δ -Cadinene	29.35	1506	0.94	0.90	1674	17.08	Sesquiterpene
trans-Calamenene	29.69	1511	0.05	0.04	1732	20.64	Sesquiterpene
α -Cadinene	30.81	1526	0.05	[0.30]	1694	18.08*	Sesquiterpene
trans- α -Bisabolene	31.85	1541	0.06	0.05	1701	18.54	Sesquiterpene
τ -Cadinol	37.50	1637	0.06	0.05	2070	39.37	Sesquiterp. alcohol
τ -Muurolol	37.61	1640	0.05	0.05	2084	39.83	Sesquiterp. alcohol
α -Muurolol	37.73	1643	0.02	0.02	2098	40.27	Sesquiterp. alcohol
α -Cadinol	38.06	1651	0.11	0.10	2124	40.97	Sesquiterp. alcohol
Oplopanone	41.02	1730	0.02	0.02	2350	46.38	Sesquiterp. alcohol
Manool	49.33	2038	tr	tr	2560	50.63	Diterp. alcohol
cis-Abienol	51.56	2136	tr	0.01	2666	52.63	Diterp. alcohol
Total identified			99.22%	98.46%			

*: 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 : 1.4680 ± 0.0003 (20 °C)

CONCLUSION

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



