

GC-MS Profiling Analysis Prepared for Jade Bloom, Inc

Date: April 17, 2018
Sample: Norway Spruce Needle
Type: Essential Oil
Source: *Picea abies*
Batch: 041827643

ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
2-Ethylfuran	tr	0.01	Furan
Toluene	0.02	27.13*	Simple phenolic
Hexanal	0.04	0.04	Aliphatic aldehyde
(3Z)-Hexenol	0.02	0.04*	Aliphatic alcohol
Hexanol	0.02	0.01	Aliphatic alcohol
Santene	0.79	0.80*	Monoterpene
Unknown	0.01	[27.13]*	Normonoterpene
Bornylene	0.01	[0.80]*	Monoterpene
Tricyclene	0.49	0.49	Monoterpene
α -Thujene	0.09	0.13	Monoterpene
α -Pinene	27.18	[27.13]*	Monoterpene
Camphene	4.35*	4.25	Monoterpene
α -Fenchene	[4.35]*	0.08	Monoterpene
Thuja-2,4(10)-diene	0.08	0.23*	Monoterpene
Benzaldehyde	0.01	0.01	Simple phenolic
meta-Cymene	0.05	4.14*	Monoterpene
Sabinene	29.87*	[0.23]*	Monoterpene
β -Pinene	[29.87]*	29.69	Monoterpene
Unknown	0.02		Monoterpene
2-Carene	4.10*	[0.23]*	Monoterpene
Myrcene	[4.10]*	[4.14]*	Monoterpene
α -Phellandrene	0.17*	0.13	Monoterpene
Pseudolimonene	[0.17]*	0.01	Monoterpene
Δ 3-Carene	3.84	3.85	Monoterpene
(3Z)-Hexenyl acetate	0.02	0.02	Aliphatic ester
α -Terpinene	0.19	0.20	Monoterpene
para-Cymene	0.38	0.41	Monoterpene
Limonene	12.24*	8.01	Monoterpene
β -Phellandrene	[12.24]*	4.29*	Monoterpene
1,8-Cineole	[12.24]*	[4.29]*	Monoterpenic ether
(Z)- β -Ocimene	0.02	0.03	Monoterpene
(E)- β -Ocimene	0.06	0.06	Monoterpene
γ -Terpinene	0.27	0.28	Monoterpene
meta-Cymenene	0.01	0.02	Monoterpene
Fenchone	0.03	[0.04]*	Aliphatic alcohol
Isoterpinolene	0.68*	0.01	Monoterpene
Terpinolene	[0.68]*	0.66	Monoterpene
para-Cymenene	0.14*	0.12	Monoterpene
γ -Campholenal	[0.14]*	0.02	Aliphatic alcohol
Unknown	0.02		Unknown
Linalool	0.06*	0.17	Monoterpenic alcohol
α -Thujone	[0.06]*	0.02	Monoterpenic ketone
endo-Fenchol	0.10	0.10*	Monoterpenic alcohol
cis-para-Menth-2-en-1-ol	0.01	1.39*	Monoterpenic alcohol
α -Campholenal	0.03	0.04	Monoterpenic aldehyde
trans-Pinocarveol	0.21	0.31	Monoterpenic alcohol
Camphor	0.43	0.46	Monoterpenic ketone
Camphene hydrate	0.15*	0.09*	Monoterpenic alcohol

meta-Mentha-4,6-dien-8-ol	[0.15]*	0.03	Monoterpenic alcohol
Isoborneol	0.10	0.39*	Monoterpenic alcohol
Myrtenyl methyl ether	0.04*	0.01	Monoterpenic ether
Pinocarvone	[0.04]*	0.06*	Monoterpenic ketone
Borneol	0.46	1.58*	Monoterpenic alcohol
Isopinocampnone	0.09	0.09	Monoterpenic ketone
Terpinen-4-ol	0.28	1.67*	Monoterpenic alcohol
meta-Cymen-8-ol	0.04*	0.04	Monoterpenic alcohol
Cryptone	[0.04]*	tr	Normonoterpenic ketone
para-Cymen-8-ol	0.01	0.01	Monoterpenic alcohol
α -Terpineol	0.20	[1.58]*	Monoterpenic alcohol
Myrtenol	0.69*	0.14	Monoterpenic alcohol
Myrtenal	[0.69]*	0.17	Monoterpenic aldehyde
Verbenone	0.04	0.10*	Monoterpenic ketone
endo-Fenchyl acetate	0.02	0.02	Monoterpenic ester
Thymol methyl ether	0.13*	0.12	Monoterpenic ether
Citronellol	[0.13]*	0.06	Monoterpenic alcohol
Carvone	0.02	0.05	Monoterpenic ketone
Piperitone	0.04	0.03	Monoterpenic ketone
Phellandral	0.06	0.08	Monoterpenic aldehyde
Bornyl acetate	1.74	1.74	Monoterpenic ester
2-Undecanone	0.04	0.03	Aliphatic ketone
Isohexyl isocaproate	0.02	0.02	Aliphatic ester
α -Longipinene	0.21*	0.25*	Sesquiterpene
α -Cubebene	[0.21]*	[0.25]*	Sesquiterpene
α -Terpinyl acetate	0.21	[1.58]*	Monoterpenic ester
Citronellyl acetate	0.02	0.11*	Monoterpenic ester
Longicyclene	0.17	0.21*	Sesquiterpene
α -Ylangene	0.07	0.05	Sesquiterpene
α -Copaene	0.07	[0.21]*	Sesquiterpene
β -Elemene	0.06	[1.67]*	Sesquiterpene
Longifolene	1.45*	[1.39]*	Sesquiterpene
Sibirene	[1.45]*	[0.06]*	Sesquiterpene
α -Cedrene	0.02	0.02	Sesquiterpene
β -Caryophyllene	1.23	[1.67]*	Sesquiterpene
β -Copaene	0.03	[0.10]*	Sesquiterpene
<i>trans</i> - α -Bergamotene	0.10	[0.09]*	Sesquiterpene
α -Humulene	0.39	[0.39]*	Sesquiterpene
<i>cis</i> -Muurolo-4(15),5-diene	0.12	[0.11]*	Sesquiterpene
<i>trans</i> -Cadin-1(6),4-diene	0.06	0.05	Sesquiterpene
γ -Muurolole	0.45	[1.58]*	Sesquiterpene
Germacrene D	[0.45]*	0.22*	Sesquiterpene
α -Amorphene	[0.45]*	[0.10]*	Sesquiterpene
β -Selinene	0.15	0.03	Sesquiterpene
γ -Amorphene	0.12	[0.22]*	Sesquiterpene
α -Muurolole	0.28	0.28	Sesquiterpene
γ -Cadinene	0.46*	1.43*	Sesquiterpene
β -Curcumene	[0.46]*	0.08	Sesquiterpene
δ -Cadinene	1.07*	[1.43]*	Sesquiterpene
<i>trans</i> -Calamenene	[1.07]*	0.02	Sesquiterpene
α -Cadinene	0.06	0.08	Sesquiterpene
α -Calacorene	0.02	0.02	Sesquiterpene

Germacrene B	0.07	0.07	Sesquiterpene
(E)-Nerolidol	0.02	0.03	Sesquiterpenic alcohol
Caryophyllene oxide	0.14*	0.09	Sesquiterpenic ether
Caryophyllene oxide isomer	[0.14]*	0.01	Sesquiterpenic ether
Spathulenol	[0.14]*	0.02	Sesquiterpenic alcohol
Humulene epoxide II	0.04	0.03	Sesquiterpenic ether
10-epi-Cubenol	0.03		Sesquiterpenic alcohol
τ -Muurolol	0.13*	0.05	Sesquiterpenic alcohol
τ -Cadinol	[0.13]*	0.06	Sesquiterpenic alcohol
α -Muurolol	0.03	0.03	Sesquiterpenic alcohol
α -Cadinol	0.11	0.11	Sesquiterpenic alcohol
Cembrene?	0.43	0.42	Diterpene
Unknown	0.11		Diterpene
(3E)-Cembrene A	0.04		Diterpene
Manoyl oxide	0.04	0.02	Diterpenic ether
Thunbergol?	0.04	0.04	Diterpenic alcohol
Manool	0.05	0.05	Diterpenic alcohol
7,13-Abietadiene	0.02		Diterpene
(Z)-Abienol	0.07	0.06	Diterpenic alcohol
Total identified	98.26%	98.09%	

*: 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



PHYSICO-CHEMICAL DATA

Physical aspect: Clear liquid

Refractive index: 1.4755 ± 0.0003 (20 °C)

CONCLUSION

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