



Gas Chromatography Analysis

Dear Customer,

Attached you will find the results of gas chromatographic analysis based on the information provided by our Producer/Laboratory for:

Sample Reference **1468**

We testify that the Chromatographic Analysis (GC) for the mentioned sample is identical with:

Product No.:	1468
Product Name:	Spruce (White Spruce) organic
Botanical Name:	Picea glauca
Batch No.:	1018594

Bühl, 2019-08-30

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Dr. David Nayan

Identification	DB-5 (%)		
3-Methylcyclopentene	0.01	2-Nonanone	0.02
Isovaleral	tr	<i>trans</i> -Sabinene hydrate	tr
2-Methylbutyral	tr	Linalool	0.14
Isoamyl alcohol	tr	Nonanal	0.02
Toluene	tr	Isoamyl isovalerate	0.01
Hexanal	0.02	endo-Fenchol	0.07
Octane	tr	3-Methyl-3-butenyl isovalerate	0.01
Ethyl 2-methylbutyrate	0.01	<i>cis</i> -para-Menth-2-en-1-ol	0.03
(3Z)-Hexenol	0.08	α -Campholenal	0.05
Hexanol	0.03	<i>cis</i> -para-Mentha-2,8-dien-1-ol	0.01
Santene	0.19	Camphor	7.43*
Styrene	0.01	<i>trans</i> -Pinocarveol	[7.43]*
2-Heptanone	tr	<i>trans</i> -para-Menth-2-en-1-ol	[7.43]*
Unknown	tr	Camphene hydrate	0.36
Heptanal	tr	Isoborneol	0.04
Bornylene	tr	Pinocamphone	0.04
Tricyclene	0.51	Pinocarvone	0.04
α -Thujene	0.14	Borneol	1.06
α -Pinene	17.39	Unknown	0.04
Camphene	7.17*	Isopinocamphone	0.05
α -Fenchene	[7.17]*	Terpinen-4-ol	0.40
Thuja-2,4(10)-diene	0.04	Cryptone	0.02
Benzaldehyde	0.01	para-Cymen-8-ol	0.03
meta-Cymene	0.02	α -Terpineol	0.71
Sabinene	24.20*	Myrtenal	0.07
β -Pinene	[24.20]*	Myrtenol	0.03
6-Methyl-5-hepten-2-one	0.02*	Verbenone	0.06
Menthatriene isomer 0	[0.02]*	Unknown	0.01
Myrcene	5.87	<i>trans</i> -Piperitol	0.01
Pseudolimonene	0.43*	endo-Fenchyl acetate	0.05
α -Phellandrene	[0.43]*	<i>trans</i> -Carveol	tr
Δ^3 -Carene	3.79	3-Methyl-3-butenyl 4-methylvalerate	0.02
α -Terpinene	0.25	Thymol methyl ether	0.30
para-Cymene	0.25	Citronellol	0.06
1,8-Cineole	13.76*	Carvone	0.02
β -Phellandrene	[13.76]*	Piperitone	0.46
Limonene	[13.76]*	Phellandral	0.02
(Z)- β -Ocimene	0.01	Unknown	0.01
(E)- β -Ocimene	0.01	Unknown	8.08*
γ -Terpinene	0.42*	<i>cis</i> -Verbenyl acetate	[8.08]*
2,6-Dimethyl-5-heptenal (melonal)	[0.42]*	Isobornyl acetate	[8.08]*
Unknown	0.01*	Bornyl acetate	[8.08]*
3-Methyl-3-butenyl butyrate?	[0.01]*	Unknown	0.02
Octanol	0.01	<i>trans</i> -Pinocarvyl acetate	0.01
Fenchone	0.06*	3-Methyl-3-butenyl 5-methylhexanoate?	0.01
Isoterpinolene	[0.06]*	exo-2-Hydroxycineole acetate	0.01
para-Cymenene	1.11*	α -Longipinene	0.04
Terpinolene	[1.11]*	Citronellyl acetate	0.11
		Longicyclene	0.03
		α -Copaene	0.02
		Geranyl acetate	0.06

β-Elemene	0.11
Longifolene	0.17
β-Caryophyllene	0.29
β-Copaene	0.01
trans-α-Bergamotene	0.03
Sesquisabinene A	0.07
3-Methyl-3-butenyl benzoate	0.02
α-Humulene	0.28
cis-Muurolo-4(15),5-diene	0.03
(E)-β-Farnesene	0.04
trans-Cadina-1(6),4-diene	0.06
γ-Muuroloene	0.07
Germacrene D	0.05
Dodecanol	0.03
β-Selinene	0.10
trans-Muurolo-4(15),5-diene	0.04
α-Selinene	0.08
α-Muuroloene	0.17
β-Bisabolene	0.22*
γ-Cadinene	[0.22]*
endo-1-Bourbonanol	0.03
trans-Calamenene	0.61*
δ-Cadinene	[0.61]*
trans-Cadina-1,4-diene	0.03
(E)-γ-Bisabolene	0.03
α-Cadinene	0.04
α-Calacorene	0.01
(E)-α-Bisabolene	0.03
Germacrene B	0.05
β-Calacorene	0.01
Germacrene D-4-ol	0.01
Caryophyllene oxide	0.02
Unknown	0.02
Unknown	0.01
10-epi-Cubenol	0.02
1-epi-Cubenol	0.02
τ-Cadinol	0.17*
τ-Muurolol	[0.17]*
α-Muurolol	0.03
Selin-11-en-4a-ol	0.16*
α-Cadinol	[0.16]*
Unknown	0.01
Germacra-4(15),5,10(14)-trien-1a-ol	0.01
α-Bisabolol	0.02
Unknown	0.02
(5Z)-Tetradecen-14-olide?	0.03
Biformene?	0.01
Cembrene?	0.01
(3E)-Cembrene A	0.01
Unknown	0.03
Unknown	0.03*
Manoyl oxide	[0.03]*

Unknown	0.03
Manool	0.01
7,13-Abietadiene	0.01
(Z)-Abienol	0.04
Isopimaral	0.01
Palustral	0.02
Abietal	0.01
Total Identified	99.18%