



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

1772

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

Product No.:

1772

Product Name:

Pine (White Pine) organic

Botanical Name:

Pinus strobus

Batch No.:

1016236

Bühl, 2019-03-19

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Dr. David Nayan

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
<i>cis</i> -Hex-3-en-1-ol	2.49	864	0.02	0.05	1319	5.55	Aliphatic alcohol
Santene	2.61	874	0.23	0.21	879	0.95	Normonoterpene
Tricyclene	3.22	915	0.40	0.37	911	1.08	Monoterpene
α -Thujene	3.31	920	0.07	32.95	945	1.22*	Monoterpene
α -Pinene	3.47	929	33.02	[32.95]	945	1.22*	Monoterpene
Camphene	3.71	944	4.52	4.74	989	1.49	Monoterpene
Thuja-2,4(10)-diene	3.80	949	0.02				Monoterpene
Sabinene	4.15	970	0.12	30.42	1040	1.90*	Monoterpene
β -Pinene	4.25	976	30.41	[30.42]	1040	1.90*	Monoterpene
Myrcene	4.50	991	9.19	9.60	1112	2.64*	Monoterpene
Δ 3-Carene	4.78*	1006	6.39	5.67	1089	2.35	Monoterpene
α -Phellandrene	4.78*	1006	[6.39]	0.51	1104	2.53	Monoterpene
α -Terpinene	4.94	1015	0.17	[9.60]	1112	2.64*	Monoterpene
Limonene	5.19*	1028	9.16	2.18	1137	2.95	Monoterpene
β -Phellandrene	5.19*	1028	[9.16]	6.94	1143	3.04	Monoterpene
para-Cymene	5.19*	1028	[9.16]	0.07	1207	3.86*	Monoterpene
<i>cis</i> - β -Ocimene	5.35	1037	0.01	0.23	1182	3.58*	Monoterpene
<i>trans</i> - β -Ocimene	5.53	1047	0.01	[0.07]	1207	3.86*	Monoterpene
γ -Terpinene	5.72	1057	0.23	[0.23]	1182	3.58*	Monoterpene
Isoterpinolene	6.11	1079	0.03	1.24	1222	4.09*	Monoterpene
Terpinolene	6.20	1083	1.24	[1.24]	1222	4.09*	Monoterpene
para-Cymenene	6.41	1095	0.03	0.03	1364	6.27	Monoterpene
endo-Fenchol	7.14	1122	0.07	0.75	1514	9.87*	Monoterp. alcohol
<i>trans</i> -Pinocarveol	7.61	1139	0.03	0.05	1562	11.67	Monoterp. alcohol
Camphor	7.76	1145	0.06	0.04	1424	7.47	Monoterp. ketone
Camphene hydrate	8.03	1154	0.04	0.38	1521	10.12*	Monoterp. alcohol
Pinocamphone	8.13	1158	0.06	0.11	1421	7.39*	Monoterp. ketone
Borneol	8.62*	1176	0.25	0.24	1613	13.81*	Monoterp. alcohol
Isopinocamphone	8.62*	1176	[0.25]	0.04	1490	9.07	Monoterp. alcohol
Terpinen-4-ol	8.79	1182	0.20	[0.38]	1521	10.12*	Monoterp. alcohol
α -Terpineol	9.46*	1203	0.57	0.75	1615	13.95*	Monoterp. alcohol
endo-Fenchyl acetate	9.87	1212	0.02	0.02	1401	6.93*	Monoterp. ester
Thymol methyl ether	10.62	1228	0.07	[0.75]	1514	9.87*	Monoterp. ether
Piperitone	11.79	1254	0.02	[0.24]	1613	13.81*	Monoterp. ketone
Bornyl acetate	12.91	1279	1.02	1.10	1500	9.39	Monoterp. ester
<i>trans</i> -Pinocarvyl acetate	13.72	1297	0.01	0.02	1530	10.46	Monoterp. ester
para-Mentha-1(7),8(10)-dien-7-yl acetate	15.46	1323	0.03	0.09	1605	13.38*	Monoterp. ester
α -Cubebene	15.87	1330	0.01	[0.02]	1401	6.93*	Sesquiterpene
α -Copaene	17.69	1357	0.03	[0.11]	1421	7.39*	Sesquiterpene
β -Bourbonene	17.80	1359	0.02	0.03	1446	8.00	Sesquiterpene

β -Elemene	18.92	1376	0.02	[0.38]	1521	10.12*	Sesquiterpene
β -Caryophyllene	20.59	1400	0.62	[0.75]	1514	9.87*	Sesquiterpene
cis-Muurola-3,5-diene	22.98	1429	0.02	0.04	1547	11.13	Sesquiterpene
α -Humulene	23.39	1433	0.27	0.33	1576	12.22*	Sesquiterpene
trans-Cadina-1(6),4-diene	25.06	1453	0.02	[0.33]	1576	12.22*	Sesquiterpene
γ -Muurolene	25.45	1458	0.04	[0.09]	1605	13.38*	Sesquiterpene
Germacrene D	25.60	1460	0.14	[0.75]	1615	13.95*	Sesquiterpene
Viridiflorene	26.21	1467	0.02	[0.24]	1613	13.81*	Sesquiterpene
Bicyclogermacrene	26.84	1475	0.04	0.09	1622	14.31	Sesquiterpene
α -Muurolene	27.63	1484	0.06	0.08	1638	15.17	Sesquiterpene
(Z,E)- α -Farnesene	27.85	1487	0.08	0.07	1662	16.42*	Sesquiterpene
γ -Cadinene	28.68	1497	0.09	[0.07]	1662	16.42*	Sesquiterpene
δ -Cadinene	29.33	1505	0.25	0.27	1668	16.73	Sesquiterpene
Caryophyllene oxide	33.82	1569	0.02				Sesquiterp. epoxide
Humulene epoxide II	35.49	1592	0.01				Sesquiterp. epoxide
τ -Cadinol	37.64	1640	0.01	0.01	2061	39.10	Sesquiterp. alcohol
α -Cadinol	38.09	1651	0.02	0.03	2114	40.72	Sesquiterp. alcohol
Manoyl oxide	47.72	1970	0.02	0.02	2190	42.71	Diterp. ether
Total Identified			99.53%	99.77%			