

GC/MS BATCH NUMBER: K10101

ESSENTIAL OIL: KUNZEA
BOTANICAL NAME: KUNZEA AMBIGUA
ORIGIN: AUSTRALIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF KUNZEA OIL	%
α -PINENE	46.4
1,8-CINEOLE	13.8
VIRIDIFLOROL	10.3
BICYCLOGERMACRENE	2.9
VIRIDIFLORENE	2.2
α -TERPINEOL	1.8
GLOBULOL	1.6
LEPTOSPERMONE	1.3
CITRONELLOL	1.2
trans-CALAMENENE	1.2
LIMONENE	1.0

Comments from Robert Tisserand: A fresh, woody essential oil with constituents in expected amounts, including some important minor ones that give this oil its unique qualities.

Date : May 18, 2016

SAMPLE IDENTIFICATION

Internal code : 16D26-PTH1-1-SM

Customer identification : Kunzea - Australia - K1010162

Type : Essential oil

Source : *Kunzea ambigua*

Customer : Plant Therapy

ANALYSIS

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

Analyst : Alexis St-Gelais, M. Sc., chimiste

Analysis date : 2016-04-29

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.	
2,4-Dimethyl-3-pentanone	1.50	781	0.13	0.12	916	0.77	Aliphatic ketone
cis-Hex-3-en-1-ol	2.40	861	0.01	0.01	1341	4.98	Aliphatic alcohol
trans-Hex-2-en-1-ol	2.53	872	tr	0.01	1369	5.40	Aliphatic alcohol
Hexanol	2.64	881	0.02	0.02	1302	4.43	Aliphatic alcohol
α -Thujene	3.23	922	0.18	46.46	961	0.95*	Monoterpene
α -Pinene	3.39	931	46.36	[46.46]	961	0.95*	Monoterpene
Camphene	3.61	945	0.02	0.03	1005	1.14	Monoterpene
Thuja-2,4(10)-diene	3.69	950	0.04	0.64	1060	1.57*	Monoterpene
Sabinene	4.03	970	0.60	[0.64]	1060	1.57*	Monoterpene
β -Pinene	4.09	974	0.73	0.71	1043	1.43	Monoterpene
Isoamyl propionate	4.13	977	0.01				Aliphatic ester
Myrcene	4.36	990	0.37	0.33	1118	2.07	Monoterpene
Pseudolimonene	4.58	1003	0.02	0.02	1112	2.01	Monoterpene
α -Phellandrene	4.63	1006	0.03	0.02	1110	1.99	Monoterpene
Isoamyl isobutyrate	4.77	1014	0.07	14.38	1152	2.47*	Aliphatic ester
α -Terpinene	4.82	1017	0.14	0.12	1124	2.15	Monoterpene
para-Cymene	5.00	1027	0.42	0.43	1212	3.17	Monoterpene
Limonene	5.05*	1029	1.18	1.00	1144	2.38	Monoterpene
β -Phellandrene	5.05*	1029	[1.18]	[14.38]	1152	2.47*	Monoterpene
1,8-Cineole	5.14	1034	13.83	[14.38]	1152	2.47*	Monoterp. ether
cis- β -Ocimene	5.22	1039	0.11	0.38	1191	2.92*	Monoterpene
trans- β -Ocimene	5.40	1049	0.73	0.71	1206	3.10	Monoterpene
γ -Terpinene	5.58	1059	0.29	[0.38]	1191	2.92*	Monoterpene
Amyl butyrate	5.66	1063	0.08				Aliphatic ester
cis-Linalool oxide (fur.)	5.89	1076	0.04	0.02	1383	5.61	Monoterp. alcohol
Terpinolene	6.05	1085	0.11	0.10	1226	3.37	Monoterpene
trans-Linalool oxide (fur.)	6.17	1092	0.02	0.02	1411	6.01	Monoterp. alcohol
para-Cymenene	6.27	1097	0.02	0.01	1374	5.47	Monoterpene
Isoamyl 2-methylbutyrate	6.43	1105	0.11	0.14	1235	3.50	Aliphatic ester
Linalool	6.47	1106	0.83	0.86	1499	7.69	Monoterp. alcohol
Isoamyl isovalerate	6.59	1111	0.28	0.32	1254	3.76	Aliphatic ester
cis-Rose oxide	6.63	1112	0.12	0.08	1299	4.37	Monoterp. ether
trans-Rose oxide	6.98	1125	0.05	0.04	1310	4.54	Monoterp. ether
α -Campholenal	7.05	1128	0.11				Monoterp. aldehyde
trans-Pinocarveol	7.32	1138	0.10	0.12	1571	9.68	Monoterp. alcohol
Citronellal	7.74	1154	0.09	0.08	1420	6.17	Monoterp. aldehyde
Pinocarvone	7.96	1162	0.02	0.02	1480	7.31	Monoterp. ketone
δ -Terpineol	8.34	1176	0.04	0.05	1607	10.78	Monoterp. alcohol
Terpinen-4-ol	8.46	1181	0.53	0.98	1533	8.53*	Monoterp. alcohol
para-Cymen-8-ol	8.89	1197	0.03	0.03	1770	18.67	Monoterp. alcohol
α -Terpineol	9.06	1203	1.80	1.89	1630	11.65*	Monoterp. alcohol

β-Phellandren-8-ol	9.11	1204	0.03	0.02	1709	15.20	Monoterp. alcohol
Verbenone	9.53	1213	0.05	0.07	1616	11.05	Monoterp. ketone
Nerol	10.14	1227	0.02	1.09	1737	16.74*	Monoterp. alcohol
Citronellol	10.36	1232	1.22	1.26	1713	15.40	Monoterp. alcohol
Neral	10.77	1241	0.11	0.17	1611	10.89	Monoterp. aldehyde
Geraniol	11.34	1254	0.16	0.17	1784	19.57	Monoterp. alcohol
Geranial	12.22	1274	0.21	0.20	1651	12.62	Monoterp. aldehyde
Citronellic acid	15.15	1329	0.01				Monoterp. acid
α-Cubebene	15.50	1334	0.09	0.07	1414	6.06	Sesquiterpene
Isolatedene?	16.77	1354	0.06				Sesquiterpene
α-Copaene	17.15	1360	0.21	0.14	1437	6.49	Sesquiterpene
Geranic acid	17.97	1372	0.11	0.14	2258	42.05	Monoterp. acid
β-Elemene	18.30	1377	0.15	0.21	1528	8.36	Sesquiterpene
α-Gurjunene	19.09	1389	0.53	0.51	1467	7.07	Sesquiterpene
β-Caryophyllene	19.93	1402	0.62	0.58	1526	8.30	Sesquiterpene
Aromadendrene	21.27	1419	0.21	[0.98]	1533	8.53*	Sesquiterpene
<i>trans</i> -α-Bergamotene	21.43	1421	0.20	[0.98]	1533	8.53*	Sesquiterpene
<i>cis</i> -Muurolo-3,5-diene	22.26	1431	0.26	0.17	1556	9.25	Sesquiterpene
α-Humulene	22.63	1435	0.13	0.23	1586	10.15*	Sesquiterpene
allo-Aromadendrene	22.91	1439	0.85	0.91	1565	9.50	Sesquiterpene
<i>trans</i> -Cadin-1(6),4-diene	24.31	1455	0.12	[0.23]	1586	10.15*	Sesquiterpene
Germacrene D	24.66	1460	0.08	2.03	1622	11.29*	Sesquiterpene
β-Selinene	25.23	1467	0.19	[1.89]	1630	11.65*	Sesquiterpene
Viridiflorene	25.67	1472	2.17	[2.03]	1622	11.29*	Sesquiterpene
Bicyclgermacrene	26.09	1477	2.85	2.77	1646	12.38	Sesquiterpene
α-Muurolole	26.78	1485	0.23	0.19	1648	12.52	Sesquiterpene
Valencene	26.92	1487	0.11	0.11	1666	13.28	Sesquiterpene
γ-Cadinene	27.78	1497	0.23	0.34	1671	13.51	Sesquiterpene
δ-Cadinene	28.47	1506	0.86	0.88	1677	13.78	Sesquiterpene
<i>trans</i> -Calamenene	28.79	1510	1.18	[1.09]	1737	16.74*	Sesquiterpene
<i>trans</i> -Cadin-1,4-diene	29.54	1521	0.24	0.23	1694	14.56	Sesquiterpene
α-Calacorene	29.87	1525	0.04	0.04	1803	20.62	Sesquiterpene
Palustrol	32.21	1557	0.41	0.35	1820	21.69	Sesquiterp. alcohol
Spathulenol	33.05*	1569	0.58	0.41	2020	34.69	Sesquiterp. alcohol
Caryophyllene oxide	33.05*	1569	[0.58]	0.13	1848	23.59	Sesquiterp. ether
Globulol	33.56	1576	1.64	1.63	1976	32.05	Sesquiterp. alcohol
Viridiflorol	34.21	1585	10.27	10.52	1987	32.70	Sesquiterp. alcohol
Ledol	34.33	1586	0.28	1.33	1913	28.18*	Sesquiterp. alcohol
Leptospermone	34.57	1590	1.34	[1.33]	1913	28.18*	Polyketone
1,10-diepi-Cubenol	36.10	1616	0.17	0.32	1955	30.81	Sesquiterp. alcohol
1-epi-Cubenol	36.30	1621	0.15				Sesquiterp. alcohol
τ-Cadinol	36.84	1634	0.08	0.11	2073	36.70	Sesquiterp. alcohol
τ-Muurolole	36.97	1637	0.08	0.08	2088	37.24	Sesquiterp. alcohol
α-Muurolole	37.14	1641	0.04	0.04	2104	37.77	Sesquiterp. alcohol

β -Eudesmol	37.19*	1642	0.15	0.10	2112	38.06	Sesquiterp. alcohol
α -Eudesmol	37.19*	1642	[0.15]	0.24	2125	38.53*	Sesquiterp. alcohol
α -Cadinol	37.41	1648	0.14	[0.24]	2125	38.53*	Sesquiterp. alcohol
Cadalene	38.04	1663	0.03	0.03	2084	37.10	Sesquiterpene
Total identified			98.56%	97.97%			

*: 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 : Faintly yellow liquid

Refractive index : 1.4740 ± 0.0003 (20 °C)

CONCLUSION

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



