

Date : November 15, 2017

SAMPLE IDENTIFICATION

Internal code : 17K10-CHS1-1-CC

Customer identification : Cedarwood Atlas - Morocco - 21112

Type : Essential oil

Source : *Cedrus atlantica*

Customer : American College of Healthcare sciences

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 : 2017-11-14

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.	
Mesityl oxide	1.69	804	0.02	0.01	1054	1.96	Aliphatic ketone
α -Pinene	3.41	926	0.02	0.01	944	1.13	Monoterpene
Limonene	5.16	1027	0.01	0.01	1137	2.84	Monoterpene
Limona ketone	7.42	1132	0.59	0.58	1462	8.16	Simple phenolic
para-Methylacetophenone	9.17	1196	0.07	1.80	1674	16.47*	Simple phenolic
α -Terpineol	9.48	1203	0.03	45.78	1633	14.32*	Monoterp. alcohol
α -Longipinene	15.84	1329	0.07	0.07	1405	6.82	Sesquiterpene
Longicyclene	17.22	1350	0.04	0.02	1422	7.23	Sesquiterpene
Sibirene	19.54	1385	0.59	1.16	1484	8.69*	Sesquiterpene
Longifolene	19.67	1387	0.55	[1.16]	1484	8.69*	Sesquiterpene
Himachala-2,4-diene	21.14	1407	0.55	0.57	1527	10.03	Sesquiterpene
Thujopsen	21.66	1413	0.13	0.12	1543	10.60	Sesquiterpene
Unknown (m/z = 105, 93 (59), 43 (52), 120 (49), 91 (49), 145 (43)... 204 (2))	22.28	1420	0.17				Sesquiterpene
α -Himachalene	23.05	1429	16.39	16.64	1557	11.11	Sesquiterpene
Vestitenone	23.88	1439	0.48				Terpenic ketone
Unknown (m/z = 131, 105 (87), 119 (86), 91 (83), 159 (63), 187 (61), 202 (59))	24.71	1449	0.69	[45.78]	1633	14.32*	Sesquiterpene
γ -Himachalene	25.49	1458	9.94	11.54	1609	13.06*	Sesquiterpene
11- α H-Himachala-1,4-diene	25.79	1462	1.91	[11.54]	1609	13.06*	Sesquiterpene
β -Himachalene	27.80*	1486	45.60	[45.78]	1633	14.32*	Sesquiterpene
α -Muurolene	27.80*	1486	[45.60]	0.45	1646	15.00	Sesquiterpene
<i>cis</i> - α -Bisabolene	27.97	1488	0.18	0.21	1656	15.55	Sesquiterpene
α -Dehydro-ar-himachalene	28.67	1496	0.95	1.17	1753	21.24	Sesquiterpene
δ -Cadinene	29.46	1507	1.83	[1.80]	1674	16.47*	Sesquiterpene
Unknown (m/z = 131, 91 (25), 202 (20), 115 (18), 159(16), 129 (16))	29.83*	1513	1.78	0.86	1781	23.02	Sesquiterpene
γ -Dehydro-ar-himachalene	29.83*	1513	[1.78]	0.60	1800	24.31	Sesquiterpene
Unknown (m/z = 187, 145 (91), 131 (64), 202 (42))	30.58	1523	0.42				
α -Calacorene	31.39	1534	0.60	0.40	1806	24.74	Sesquiterpene
<i>trans</i> - α -Bisabolene	31.89	1541	0.54	0.56	1707	18.20	Sesquiterpene
β -Calacorene	32.64	1552	0.06	0.06	1839	27.10	Sesquiterpene
Himachalene oxide	33.52	1564	0.34	0.32	1850	27.96	Sesquiterp. ether
(<i>E</i>)-Nerolidol	34.05	1572	0.12	0.14	1984	35.78	Sesquiterp. alcohol
Longiborneol	35.20	1588	0.27	0.25	2020	37.33	Sesquiterp. alcohol
β -Himachalene oxide	35.69	1595	0.55	0.50	1878	29.97	Sesquiterp. ether

Unknown (m/z = 138, 110 (77), 137 (72), 41 (71)... 220 (29))	35.87	1597	0.50				Oxygenated sesquiterpene
1,10-diepi-Cubenol	36.65	1616	0.64	0.51	1951	34.30	Sesquiterp. alcohol
1-epi-Cubenol	36.75	1619	0.19	0.09	1973	35.28	Sesquiterp. alcohol
Cubenol	37.30	1632	0.09	0.10	1942	33.87	Sesquiterp. alcohol
Himachalol	37.76	1643	0.65	1.36	2083	39.30*	Sesquiterp. alcohol
Allohimachalol	38.27	1656	0.80	0.76	2117	40.38	Sesquiterp. alcohol
β -Atlantone	38.71*	1667	0.39	0.09	2056	38.50	Sesquiterp. ketone
(E)-10,11-Dihydroatlantone	38.71*	1667	[0.39]	0.24	2035	37.82	Sesquiterp. ketone
(Z)- γ -Atlantone	39.40	1683	0.69	[1.36]	2083	39.30*	Sesquiterp. ketone
Deodarone	39.64	1689	0.91	0.89	2094	39.66	Sesquiterp. ketone
Deodarone analog?	39.74	1692	0.88	0.89	2099	39.83	Sesquiterp. ketone
(E)- γ -Atlantone	39.89	1695	0.84	0.82	2103	39.97	Sesquiterp. ketone
(Z)- α -Atlantone	40.59	1717	0.60	0.62	2135	40.84	Sesquiterp. ketone
(E)- α -Atlantone	42.44	1775	3.33	3.31	2203	42.60	Sesquiterp. ketone
Nootkatone	43.00	1793	0.20	0.20	2350	45.97	Sesquiterp. ketone
Total identified			94.42%	92.85%			

*: 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 : Light yellow liquid

Refractive index : 1.5113 \pm 0.0003 (20 °C)

CONCLUSION

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

17K10-CHS1-1-CC_BP5



