

## GC/MS BATCH NUMBER: C70101

---

**ESSENTIAL OIL:** CEDARWOOD VIRGINIAN  
**BOTANICAL NAME:** JUNIPERUS VIRGINIANA  
**ORIGIN:** USA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF CEDARWOOD VIRGINIAN OIL	%
THUJOPSENE	31.5
$\alpha$ -CEDRENE	23.8
$\alpha$ -CEDROL	16.4
$\beta$ -CEDRENE	4.6
WIDDROL	2.6
CUPARENE	1.7
$\beta$ -CHAMIGRENE	1.2
$\gamma$ -CUPRENENE	1.0

Comments from Robert Tisserand: Excellent odor profile, and constituents are all in expected amounts.

**Date :** February 26, 2016

*SAMPLE IDENTIFICATION*

**Internal code :** 16B22-PTH6-1-LC

**Customer identification :** Cedarwood Virginia - USA - C70101511R

**Type :** Essential oil

**Source :** *Juniperus virginiana*

**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 :** 2016-02-25

Checked and approved by :

---

Alexis St-Gelais, M. Sc., chimiste 2013-174

*Note: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.*

*This report is digitally signed, it is only considered valid if the digital signature is intact.*

IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
$\alpha$ -Pinene	2.81	924	0.15	0.15	946	0.93	Monoterpene
Camphene	3.05*	939	0.01	tr	1013	1.17	Monoterpene
$\alpha$ -Fenchene	3.05*	939	[0.01]	0.01	1006	1.12	Monoterpene
Thuja-2,4(10)-diene	3.16	946	0.01	0.01	1067	1.62	Monoterpene
$\beta$ -Pinene	3.53	970	tr	tr	1050	1.48	Monoterpene
$\Delta$ 3-Carene	4.07	1003	0.02	0.02	1099	1.88	Monoterpene
para-Cymene	4.47*	1026	0.03	0.01	1213	3.25	Monoterpene
Limonene	4.47*	1026	[0.03]	0.01	1144	2.41	Monoterpene
Terpinolene	5.48	1083	0.01	0.01	1227	3.44	Monoterpene
para-Cymenene	5.71	1096	0.01	0.01	1373	5.55	Monoterpene
<i>trans</i> -Pinocarveol	6.66	1139	0.02	0.03	1585	10.29	Monoterp. alcohol
Camphor	6.73	1142	0.01	0.01	1430	6.51	Monoterp. ketone
$\alpha$ -Terpineol	8.20	1204	0.04	0.07	1633	12.10	Monoterp. alcohol
diepi- $\alpha$ -Cedrene	15.04	1355	0.36	0.39	1435	6.60	Sesquiterpene
$\alpha$ -Duprezianene	15.35	1360	0.50	0.53	1452	6.89	Sesquiterpene
Isolongifolene	15.54	1363	0.06	0.07	1446	6.78	Sesquiterpene
Sesquithujene isomer?	16.13	1374	0.29				Sesquiterpene
7-epi-Sesquithujene	16.36	1378	0.12				Sesquiterpene
Sesquithujene	17.43*	1396	24.15	0.90	1512	8.10	Sesquiterpene
$\alpha$ -Cedrene	17.43*	1396	[24.15]	23.82	1505	7.89	Sesquiterpene
$\beta$ -Cedrene	17.77*	1401	6.12	4.59	1520	8.35	Sesquiterpene
$\beta$ -Caryophyllene	17.77*	1401	[6.12]	0.64	1524	8.46	Sesquiterpene
Thujopsen	18.79	1414	31.51	31.02	1546	9.15	Sesquiterpene
$\alpha$ -Himachalene	19.44*	1422	0.45	0.35	1556	9.44	Sesquiterpene
Seychellene	19.44*	1422	[0.45]	0.10	1547	9.18	Sesquiterpene
$\beta$ -Barbatene	19.78	1427	0.12				Sesquiterpene
Thujopsadiene	20.26	1433	0.05	0.05	1604	10.86	Sesquiterpene
$\alpha$ -Acoradiene	20.70	1439	0.58	0.63	1591	10.50	Sesquiterpene
$\beta$ -Acoradiene	20.96	1442	0.42	0.46	1599	10.73	Sesquiterpene
$\gamma$ -Himachalene	21.26	1446	0.20	0.29	1619	11.50	Sesquiterpene
$\beta$ -Chamigrene	21.70	1452	1.19	1.37	1628	11.90	Sesquiterpene
$\beta$ -Alaskene	23.29†*	1473	4.10	0.91	1639	12.37	Sesquiterpene
$\alpha$ -Curcumene	23.29*	1473	[2.14]	0.11	1703	15.24	Sesquiterpene
$\alpha$ -Cuprenene	23.29*	1473	[2.14]				Sesquiterpene
$\alpha$ -Chamigrene	23.68†*	1478	[4.10]	0.99	1641	12.47	Sesquiterpene
$\beta$ -Himachalene	23.68†*	1478	[4.10]	0.73	1625	11.74	Sesquiterpene
Unknown, coelutes in MS	23.68†*	1478	[4.10]				Sesquiterpene
Cuparene	24.41	1488	1.70	1.59	1718	16.05	Sesquiterpene
$\alpha$ -Alaskene	24.51	1489	0.46				Sesquiterpene
7-epi- $\alpha$ -Selinene	24.82	1493	0.09	0.09	1662	13.43	Sesquiterpene
<i>cis</i> - $\alpha$ -Bisabolene	25.23	1497	0.11	0.07	1670	13.80	Sesquiterpene

<i>trans</i> -Calamenene	25.86	1505	0.10	0.14	1736	17.15	Sesquiterpene
<i>trans</i> - $\gamma$ -Bisabolene	25.98	1506	0.08	0.06	1678	14.13	Sesquiterpene
$\gamma$ -Cuprenene	26.37	1511	0.94	1.32	1610	11.11	Sesquiterpene
$\delta$ -Cuprenene	27.78	1528	0.19				Sesquiterpene
allo-Cedrol	31.80	1576	0.29	0.17	1986	33.26	Sesquiterp. alcohol
$\alpha$ -Cedrol	33.09*	1591	19.35	16.36	2001	34.08	Sesquiterp. alcohol
Widdrol	33.09*	1591	[19.35]	2.57	2038	35.78	Sesquiterp. alcohol
epi-Cedrol	33.66	1600	0.32				Sesquiterp. alcohol
$\alpha$ -Acorenol	34.51	1618	0.57				Sesquiterp. alcohol
$\beta$ -Acorenol	35.10	1630	0.58				Sesquiterp. alcohol
Cedr-8-en-15-ol?	36.13	1652	0.34	0.33	2219	41.36	Sesquiterp. alcohol
$\alpha$ -Bisabolol	37.68	1684	0.35	0.33	2138	39.13	Sesquiterp. alcohol
Cedr-8-en-13-ol	37.75	1685	0.11	0.25	2266	42.48	Sesquiterp. alcohol
Unknown (m/z = 91, 105 (92), 123 (64), 93 (58), 79 (57), 107 (57), 135 (54), 55 (51), 119 (50)... 220 (18))	37.95	1690	0.57				Oxygenated sesquiterp.
Thujopsenal?	38.08	1691	0.16				Sesquiterp. aldehyde
<b>Total identified</b>			<b>96.27%</b>	<b>91.57%</b>			

\*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

†: Peaks apexes were resolved, but peaks overlapped and were summed for analysis

Note: no correction factor was applied

#### OTHER DATA

**Physical aspect :** Clear liquid

**Refractive index :** 1.5030  $\pm$  0.0003 (20 °C)

#### CONCLUSION

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



