

# Analysis Orange , Blood Essential Oil

Laboratoire  
**Ph**to**Ch**emia



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Date : December 14, 2016

SAMPLE IDENTIFICATION

**Internal code :** 16L05-FSE8-1-DM  
**Customer identification :** Orange - Lot#071816  
**Type :** Essential oil  
**Source :** *Citrus sinensis*  
**Customer :** Flowers Shining Everywhere Inc.



ANALYSIS

**Method :** PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).  
**Analyst :** Sylvain Mercier, M. Sc., chimiste  
**Analysis date :** 2016-12-12

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.	
α-Pinene	3.36	925	0.50	0.51	945	0.86	Monoterpene
Sabinene	4.08	968	0.45	0.44	1055	1.49	Monoterpene
β-Pinene	4.14	972	0.04	0.04	1038	1.36	Monoterpene
Myrcene	4.44	990	1.87	1.89	1115	1.98	Monoterpene
Δ3-Carene	4.70	1005	0.20	0.14	1090	1.77	Monoterpene
Octanal	4.83	1012	0.19	0.19	1230	3.35	Aliphatic aldehyde
1,8-Cineole	5.30*	1038	95.07	94.92	1159	2.50*	Monoterp. ether
Limonene	5.30*	1038	[95.07]	[94.92]	1159	2.50*	Monoterpene
para-Cymene	5.30*	1038	[95.07]	0.02	1208	3.06	Monoterpene
trans-β-Ocimene	5.50	1049	0.02	0.02	1204	3.01	Monoterpene
γ-Terpinene	5.68	1059	0.02	0.01	1190	2.86	Monoterpene
cis-Sabinene hydrate	6.03	1078	0.01	0.01	1401	5.77	Monoterp. alcohol
Terpinolene	6.14	1084	0.03	0.02	1224	3.28	Monoterpene
Linalool	6.68	1108	0.34	0.34	1483	7.24	Monoterp. alcohol
Nonanal	6.72	1110	0.04	0.03	1335	4.82	Aliphatic aldehyde
cis-Limonene oxide	7.26	1130	0.03	0.03	1368	5.30	Monoterp. ether
trans-Limonene oxide	7.38	1134	0.02	0.02	1380	5.47	Monoterp. ether
Citronellal	7.89	1153	0.04	0.03	1413	5.96	Monoterp. aldehyde
Terpinen-4-ol	8.72	1184	0.02	0.03	1529	8.18	Monoterp. alcohol
α-Terpineol	9.40	1204	0.06	0.06	1618	10.83	Monoterp. alcohol
Decanal	9.68	1211	0.18	0.17	1437	6.38*	Aliphatic aldehyde
Neral	11.04	1241	0.04	0.02	1592	10.05	Monoterp. aldehyde
Geranial	12.54	1274	0.07	0.06	1644	11.88	Monoterp. aldehyde
α-Copaene	17.43	1356	0.02	[0.17]	1437	6.38*	Sesquiterpene
β-Cubebene	18.42	1371	0.03	0.06	1492	7.41	Sesquiterpene
β-Caryophyllene	20.31	1399	0.02	0.01	1524	8.04	Sesquiterpene
Dodecanal	21.51	1413	0.03	0.02	1649	12.08	Aliphatic aldehyde
Germacrene D	25.29	1459	0.01	0.03	1628	11.16	Sesquiterpene
α-Selinene	26.29	1470	0.10	0.10	1638	11.56	Sesquiterpene
Valencene	27.46	1484	0.01	0.01	1654	12.32	Sesquiterpene
δ-Cadinene	29.01	1505	0.02	0.02	1679	13.40	Sesquiterpene
β-Sinensal	39.67	1692	0.02	0.02	2127	37.80	Sesquiterp. aldehyde
α-Sinensal	41.61	1753	0.01	0.01	2228	40.63	Sesquiterp. aldehyde
Nootkatone	42.89	1794	0.01	0.01	2352	43.50	Sesquiterp. ketone
<b>Total identified</b>			<b>99.52%</b>	<b>99.29%</b>			

\*: 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

Essential oil, *Citrus sinensis*  
Internal Code: 16L05-FSE8-1-DM

Customer Identification:  
Orange - Lot#071816

Report prepared for  
Flowers Shining Everywhere Inc.

OTHER DATA

**Physical aspect:** Bright yellow liquid  
**Refractive index:** 1.4775 ± 0.0003 (20 °C)

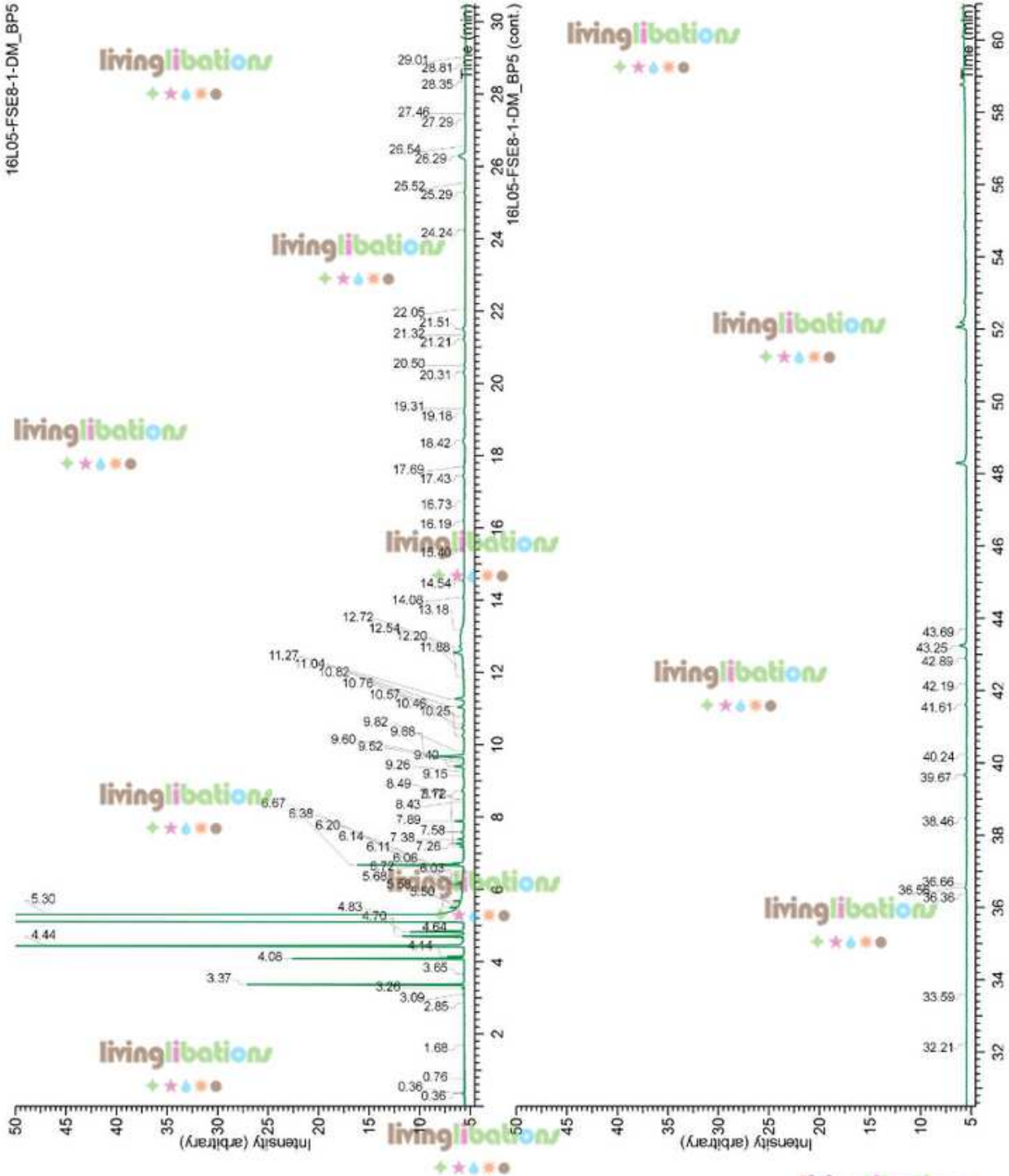
CONCLUSION

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





16L05-FSE8-1-DM\_BP5



16L05-FSE8-1-DM\_WAX

