

## GC/MS BATCH NUMBER: RB0100

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**ESSENTIAL OIL:** ROSE OTTO  
**BOTANICAL NAME:** ROSA X DAMASCENA  
**ORIGIN:** BULGARIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF ROSE OTTO OIL	%
CITRONELLOL	31.0
GERANIOL	20.5
NONADECANE	8.2
NEROL	7.7
PHENYLETHYL ALCOHOL	4.3
HENEICOSANE	3.3
LINALOOL	3.1
EICOSANE	2.3
ETHANOL	1.6
GERANYL ACETATE	1.5
trans-9-NONADECENE	1.4
METHYLEUGENOL	1.2
α-PINENE	1.0
HEPTADECANE	0.9

Comments from Robert Tisserand: Beautiful odor profile, with a pleasant "white rose" quality. Of the 8 constituents in the ISO standard, 7 are within range with heptadecane marginally low - not a concern.

**Date :** September 18, 2015

*SAMPLE IDENTIFICATION*

**Internal code :** 15111-PTH2-1-HM

**Customer identification :** Rose otto - Bulgaria - RB010056

**Type :** Essential Oil

**Source :** *Rosa x damascena*

**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.

**Analysis date :** 2015-09-11

IDENTIFIED COMPOUNDS

Identification	Colonne: BP5			Colonne: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Ethanol	0.28	476	1.64	1.62	896	0.66	Aliphatic alcohol
Isoamyl alcohol	0.86	731	0.01	0.02	1175	2.96*	Aliphatic alcohol
2-Methylbutyl alcohol	0.88	734	0.01	[0.02]	1175	2.96*	Aliphatic alcohol
Hexanal	1.32	805	0.02	0.01	1044	1.52	Aliphatic aldehyde
<i>cis</i> -Hex-3-en-1-ol	1.99	864	0.03	0.03	1349	5.45	Aliphatic alcohol
Hexanol	2.17	880	0.23	0.23	1322	5.05	Aliphatic alcohol
Heptanal	2.55	910	0.05	0.05	1148	2.62	Aliphatic aldehyde
$\alpha$ -Pinene	2.80	926	1.01	0.98	984	1.06	Monoterpene
Camphene	3.06	942	0.01	0.01	1024	1.34	Monoterpene
Sabinene	3.48	968	0.01	0.01	1082	1.86	Monoterpene
$\beta$ -Pinene	3.52	971	0.21	0.22	1063	1.69	Monoterpene
Benzaldehyde	3.57	974	0.09	0.09	1459	7.45	Simple phenolic
Myrcene	3.82	991	0.13	0.14	1134	2.44	Monoterpene
Octanal	4.19	1013	0.01	0.01	1252	4.03	Aliphatic aldehyde
$\alpha$ -Terpinene	4.24	1015	0.01	0.01	1139	2.50	Monoterpene
Limonene	4.45*	1028	0.13	0.10	1156	2.72	Monoterpene
<i>para</i> -Cymene	4.45*	1028	[0.13]	0.03	1228	3.67	Monoterpene
<i>cis</i> - $\beta$ -Ocimene	4.66	1040	0.03	0.04	1215	3.49	Monoterpene
<i>trans</i> - $\beta$ -Ocimene	4.83	1049	0.01	0.04	1219	3.55	Monoterpene
$\gamma$ -Terpinene	4.99	1058	0.09	0.09	1206	3.35	Monoterpene
<i>cis</i> -Linalool oxide (fur.)	5.28	1075	0.03	0.02	1401	6.24	Monoterp. alcohol
Terpinolene	5.45	1084	0.02	0.02	1240	3.84	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	5.58	1092	0.02	0.03	1424	6.71	Monoterp. alcohol
Linalool	5.94	1110	3.08	3.11	1517	8.85	Monoterp. alcohol
<i>cis</i> -Rose oxide	5.99	1112	0.50	0.27	1312	4.90	Monoterp. ether
Phenylethyl alcohol	6.32*	1127	4.40	4.29	1835	25.02	Simple phenolic
<i>trans</i> -Rose oxide	6.32*	1127	[4.40]	0.11	1324	5.08	Monoterp. ether
Citronellal	6.91	1154	0.05	0.04	1434	6.93	Monoterp. aldehyde
Terpinen-4-ol	7.53	1183	0.37	0.36	1545	9.77	Monoterp. alcohol
$\alpha$ -Terpineol	8.08*	1205	1.03	0.97	1641	13.52*	Monoterp. alcohol
$\beta$ -Phellandren-8-ol	8.08*	1205	[1.03]	0.13	1719	17.48	Monoterp. alcohol
Nerol	9.09	1232	7.74	7.90	1753	19.61	Monoterp. alcohol
Citronellol	9.54*	1244	32.30	30.97	1733	18.39	Monoterp. alcohol
Neral	9.54*	1244	[32.30]	0.73	1620	12.53*	Monoterp. aldehyde
<i>cis</i> -Isogeraniol	9.74	1249	0.02	0.02	1760	20.03	Monoterp. alcohol
Geraniol	10.40	1267	20.54	20.52	1809	23.16*	Monoterp. alcohol
Geranial	10.76*	1277	0.38	0.32	1667	14.75	Monoterp. aldehyde
Citronellyl formate	10.76*	1277	[0.38]	0.02	1577	10.81	Monoterp. ester
Geranyl formate?	11.87	1305	0.01				Monoterp. ester
Citronellyl acetate	14.61	1352	0.75	[0.73]	1620	12.53*	Monoterp. ester
Eugenol	14.98	1359	0.93	1.05	2088	38.63*	Phenylpropanoid

Neryl acetate	15.15*	1362	0.28	0.21	1679	15.34	Monoterp. ester
$\alpha$ -Copaene	15.15*	1362	[0.28]	0.01	1438	7.02	Sesquiterpene
Geranyl acetate	16.48	1385	1.45	1.43	1712	17.04*	Monoterp. ester
$\beta$ -Caryophyllene	17.28	1399	0.85	0.78	1529	9.26	Sesquiterpene
Methyleugenol	18.52*	1416	1.27	1.20	1963	33.42	Phenylpropanoid
$\alpha$ -Guaiene	18.52*	1416	[1.27]	0.06	1533	9.37	Sesquiterpene
$\alpha$ -Humulene	19.75	1432	0.11	0.12	1595	11.41	Sesquiterpene
Germacrene D	21.76	1458	0.25	0.26	1630	12.99	Sesquiterpene
$\delta$ -Guaiene	23.52	1482	0.05	[0.97]	1641	13.52*	Sesquiterpene
Pentadecane	24.76*	1498	0.09	0.10	1504	8.41*	Alkane
( <i>E,E</i> )- $\alpha$ -Farnesene	25.16	1503	0.16	1.00	1709	16.89*	Sesquiterpene
( <i>E</i> )-Nerolidol	30.34	1565	0.18	0.16	2000	35.56	Sesquiterp. alcohol
Hexadecane	33.39	1602	0.05	0.13	1605	11.78	Alkane
<i>trans</i> -8-Heptadecene	36.90	1674	0.08	[1.43]	1712	17.04*	Alkene
Heptadecane	38.04	1698	0.92	[1.00]	1709	16.89*	Alkane
( <i>2E,6E</i> )-Farnesol	38.83	1721	0.40	0.47	2309	44.39	Sesquiterp. alcohol
Octadecane	41.43	1797	0.45	[20.52]	1809	23.16*	Alkane
<i>trans</i> -9-Nonadecene	43.45	1868	1.38	1.24	1905	30.08	Alkene
Nonadecane	44.37	1900	8.24	7.62	1920	30.96	Alkane
Eicosane	46.84	1997	2.31	2.11	2013	36.02	Alkane
<i>trans</i> -10-Heneicosene	48.42	2064	0.08	[1.05]	2088	38.63*	Alkene
Heneicosane	49.20	2097	3.28	2.98	2114	39.44	Alkane
Docosane	51.35	2195	0.07	0.08	2208	41.99	Alkane
<i>trans</i> -11-Tricosene	53.22	2283	0.09	0.08	2262	43.30	Alkene
Tricosane	53.46	2295	0.66	0.59	2306	44.34	Alkane
Tetracosane	55.46*	2394	0.04	0.04	2406	46.51*	Alkane
Pentacosane	57.39	2492	0.25	0.31	2506	48.56	Alkane
<b>Total identified</b>			<b>98.89%</b>	<b>95.59%</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

*OTHER DATA*

**Physical aspect :** Light yellow liquid

**Refractive index :**  $1.4623 \pm 0.0003$  (20 °C)

*CONCLUSION*

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

Checked and approved by :

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

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