

Date : September 30, 2016

SAMPLE IDENTIFICATION

Internal code : 16I23-NGA4-1-SM

Customer identification : White Rose CO2 - Bulgaria - Batch #BU-58556

Type : Essential oil

Source : *Rosa alba*

Customer : Nature's Gift Aromatherapy

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 : 2016-09-27

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.	
Ethanol	0.33	496	0.23	0.16	795	0.51	Aliphatic alcohol
Isoamyl alcohol	1.15	729	0.01	0.01	1142	2.30*	Aliphatic alcohol
2-Methylbutyl alcohol	1.17	732	tr	[0.01]	1142	2.30*	Aliphatic alcohol
<i>cis</i> -Hex-3-en-1-ol	2.50	865	0.01	0.01	1335	4.82	Aliphatic alcohol
Hexanol	2.71	881	0.02				Aliphatic alcohol
Heptanal	3.06	907	0.02	0.02	1122	2.06	Aliphatic aldehyde
α -Pinene	3.35	924	0.04	0.03	942	0.84	Monoterpene
β -Pinene	4.12	971	0.01	0.01	1035	1.33	Monoterpene
Benzaldehyde	4.17	974	0.02	0.01	1429	6.22	Simple phenolic
Myrcene	4.41	988	tr				Monoterpene
γ -Terpinene	5.65	1058	0.01	tr	1188	2.83	Monoterpene
Benzyl alcohol	5.76	1064	1.70	1.57	1770	17.96	Simple phenolic
Linalool	6.63	1106	0.03	0.02	1488	7.33	Monoterp. alcohol
<i>cis</i> -Rose oxide	6.69	1109	0.02	0.02	1294	4.24	Monoterp. ether
<i>trans</i> -Rose oxide	7.05	1122	tr	0.01	1312	4.50	Monoterp. ether
Phenylethyl alcohol	7.34	1133	15.39	14.35	1804	19.91	Simple phenolic
Terpinen-4-ol	8.70*	1184	0.06	0.03	1526	8.09*	Monoterp. alcohol
Phenylethyl formate	8.70*	1184	[0.06]				Phenolic ester
α -Terpineol	9.35	1203	tr	0.01	1633	11.41	Monoterp. alcohol
Nerol	10.54	1230	1.37	1.22	1728	15.58	Monoterp. alcohol
Citronellol	10.81	1236	2.10	1.87	1705	14.56	Monoterp. alcohol
Neral	10.99	1240	0.16	0.15	1595	10.15	Monoterp. aldehyde
<i>cis</i> -Isogeraniol	11.22	1245	0.03	0.03	1741	16.29	Monoterp. alcohol
Geraniol	11.89	1260	2.64	2.34	1780	18.54	Monoterp. alcohol
Geranial	12.48	1273	0.29	0.23	1647	12.01	Monoterp. aldehyde
Citronellyl formate	12.62	1276	0.01	0.01	1553	8.89	Monoterp. ester
Citronellyl acetate	16.98	1349	0.02	0.02	1600	10.30	Monoterp. ester
Eugenol	17.53	1357	0.18	0.15	2054	35.36	Phenylpropanoid
Geranyl acetate	19.09	1381	0.06	0.05	1688	13.79	Monoterp. ester
β -Caryophyllene	20.21*	1398	0.38	0.15	1523	8.00	Sesquiterpene
Geranic acid	20.21*	1398	[0.38]	0.19	2256	41.35	Monoterp. acid
Methyleugenol	21.33	1411	0.04	1.89	1930	28.22*	Phenylpropanoid
α -Guaiene	21.85	1418	0.03	[0.03]	1526	8.09*	Sesquiterpene
α -Humulene	23.04	1432	0.02	0.01	1581	9.73	Sesquiterpene
δ -Cadinene	28.84	1502	0.06	0.04	1678	13.37	Sesquiterpene
(<i>E</i>)-Nerolidol	33.45	1565	0.01	0.02	2003	32.56	Sesquiterp. alcohol
α -Muurolol	37.65	1645	0.05	0.04	2116	37.41	Sesquiterp. alcohol
Heptadecane	39.73	1694	0.14	0.10	1715	14.97	Alkane
(2 <i>E</i> ,6 <i>E</i>)-Farnesol	40.58	1721	0.34	0.29	2294	42.22	Sesquiterp. alcohol
<i>trans</i> -9-Nonadecene	44.89	1866	0.73	0.59	1917	27.35	Alkene
Nonadecane	45.71	1896	2.11	[1.89]	1930	28.22*	Alkane

Eicosane	48.18*	1995	0.52	0.26	2037	34.55	Alkane
Palmitic acid	48.18*	1995	[0.52]	0.17	2887	53.28	Fatty acid
<i>trans</i> -10-Heneicosene	49.79	2065	0.04	0.06	2130	37.92	Alkene
Heneicosane	50.54	2096	2.59	2.14	2145	38.43	Alkane
Linoleic acid	51.96	2161	0.21	0.29	3103	56.68	Fatty acid
Oleic acid	52.10	2167	0.22	0.39	3120	56.94	Fatty acid
Docosane	52.67	2193	0.15	0.18	2236	40.83	Alkane
Stearic acid	52.69	2195	0.11	0.06	3085	56.40	Fatty acid
Tricosane	54.82	2296	1.33	1.03	2355	43.59	Alkane
Tetracosane	56.80	2395	0.14	0.09	2458	45.71	Alkane
Pentacosane	58.75	2496	1.21	0.95	2568	47.78	Alkane
Hexacosane	60.59	2596	0.21	0.21	2586	48.12	Alkane
Unknown phenylethyl ester I	62.10	2680	0.29				Phenolic ester
Heptacosane	62.43	2699	3.41	2.91	2786	51.63	Alkane
Unknown (m/z = 69, 123 (86), 138 (82), 81 (69), 95 (67), 41 (59), 55 (53)...))	62.61	2709	0.13				
Unknown geranyl ester I	63.25	2746	0.25				Monoterp. ester
Octacosane	64.11	2796	0.26	0.31	2878	53.15	Alkane
Unknown (m/z = 105, 104 (37), 67 (20), 79 (17), 91 (14)...))	65.12	2858	0.47				
Unknown (m/z = 105, 104 (37), 79 (35), 91 (26), 67 (20)...))	65.28	2867	0.46				
<i>trans</i> -14-Nonacosene	65.50	2880	1.00				Alkene
Unknown phenylethyl ester II	65.69	2892	1.35				Phenolic ester
Nonacosane	65.81	2898	1.78	1.80	2999	55.08	Alkane
Citronellyl stearate	66.03	2912	0.28				Monoterp. ester
Unknown (m/z = 69, 81 (82), 138 (80), 95 (79), 41 (68), 123 (66), 43 (56)...))	66.12	2917	0.86				Monoterp. ester
Geranyl stearate	66.27	2926	0.45				Monoterp. ester
Unknown geranyl ester III	66.65	2950	1.52				Monoterp. ester
Unknown geranyl ester IV	66.79	2959	0.12				Monoterp. ester
Hentriacontane	69.00	3099	2.44	1.80	3216	58.35	Alkane
α -Tocopherol	69.34	3122	0.39				Tocopherol
Dotriacontane	70.45	3196	0.22	0.49	3331	60.01	Alkane
Unknown (m/z = 409, 69 (98), 55 (67), 41 (65), 95 (54)... 242? (13)))	71.51	3265	1.29				Oxygenated triterp.

Unknown (m/z = 69, 163 (74), 411 (66), 41 (62), 55 (58), 105 (51), 95 (48), 191 (44)... 426? (15))	72.32	3312	1.50				Oxygenated triterp.
Unknown (m/z = 205, 68 (78), 218 (77), 107 (76), 81 (75)... 424 (42), 488 (8))	72.48	3321	1.92				Oxygenated triterp.
Unknown (m/z = 137, 324 (50), 312 (23), 91 (19), 325 (16), 488 (15))	72.94	3346	1.18				Oxygenated triterp.
Unknown (m/z = 218, 189 (61), 93 (59), 107 (57), 81 (56), 95 (55), 121 (51), 135 (51), 69 (50), 207 (50)... 426 (24))	73.27	3363	0.44				Oxygenated triterp.
Unknown (m/z = 55, 81 (94), 69 (89), 107 (89), 121 (87), 109 (87), 205 (85), 95 (83)... 424 (47))	74.49	3420	1.05				Oxygenated triterp.
Unknown (m/z = 121, 123 (68), 107 (60), 189 (58), 95 (55), 109 (52), 177 (51)... 207 (45), 426 (19))	75.20	3451	1.61				Oxygenated triterp.
Unknown (m/z = 109, 69 (79), 95 (44), 43 (41), 93 (35)... 207 (30), 426	76.60	3505	3.71				Oxygenated triterp.
Unknown (m/z = 57, 43 (98), 55 (86), 69 (84), 95 (79), 123 (73), 81 (72), 71 (70)...))	77.66	3541	0.50	0.37	3835	66.71	Triterpene
Total identified			48.83%	38.79%			

*: 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 : Yellow paste

Refractive index : N/A \pm 0.0003 (20 °C)

CONCLUSION

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

