

GC-MS Profiling Analysis Prepared for Jade Bloom, Inc

Date: July 18, 2018
Sample: Helichrysum Italicum
Type: Essential Oil
Source: *Helichrysum italicum*
Batch: DL-076

IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
2-Methyl-3-pentanone	1.19	743	0.15	0.15	897	0.84	Aliphatic ketone
2-Methyl-2-heptene	1.57	792	0.01				Alkene
2,4-Dimethyl-3-pentanone	1.59	795	0.10	28.12	953	1.06*	Aliphatic ketone
4-Methyl-3-hexanone	2.14	839	0.25	0.28	1013	1.32	Aliphatic ketone
Bornylene	2.96	902	0.04	0.03	891	0.81	Monoterpene
α -Thujene	3.33	924	0.03	[28.12]	953	1.06*	Monoterpene
α -Pinene	3.48	933	27.98	[28.12]	953	1.06*	Monoterpene
α -Fenchene	3.70	946	0.42	0.41	987	1.22	Monoterpene
Camphene	3.72	947	0.15	0.18	997	1.27	Monoterpene
Thuja-2,4(10)-diene	3.81	952	0.02	0.03	1055	1.71	Monoterpene
β -Pinene	4.22	976	0.60	0.56	1041	1.58	Monoterpene
Myrcene	4.49	993	0.09	0.05	1113	2.27	Monoterpene
6-Methyl-5-hepten-2-one	4.57	997	0.01	0.02	1271	4.35	Aliphatic ketone
α -Phellandrene	4.77*	1008	0.13	0.03	1105	2.19	Monoterpene
6-Methyl-5-hepten-2-ol	4.77*	1008	[0.13]	0.08	1417	6.56	Aliphatic alcohol
Δ^3 -Carene	4.77*	1008	[0.13]	0.01	1068	1.84	Monoterpene
α -Terpinene	4.96	1019	0.23	0.20	1121	2.35	Monoterpene
para-Cymene	5.16	1030	0.19	0.20	1203	3.40	Monoterpene
Limonene	5.20*	1032	3.83	4.17	1140	2.59*	Monoterpene
β -Phellandrene	5.20*	1032	[3.83]	[4.17]	1140	2.59*	Monoterpene
1,8-Cineole	5.25	1035	0.36	[4.17]	1140	2.59*	Monoterp. ether
<i>cis</i> - β -Ocimene	5.37	1041	0.02	0.53	1184	3.16*	Monoterpene
<i>trans</i> - β -Ocimene	5.55	1051	0.05	0.04	1197	3.33	Monoterpene
Isobutyl angelate	5.67	1058	0.56	0.76	1233	3.81*	Aliphatic ester
γ -Terpinene	5.74	1061	0.52	[0.53]	1184	3.16*	Monoterpene
Terpinolene	6.21	1087	0.19	0.18	1219	3.62	Monoterpene
para-Cymenene	6.47	1101	0.02	0.02	1379	5.96	Monoterpene
2,4-Dimethyl-heptane-3,5-dione	6.57	1105	0.07	0.06	1464	7.53	Aliphatic ketone
2-Methylbutyl 2-methylbutyrate	6.64	1107	0.18	[0.76]	1233	3.81*	Aliphatic ester
Linalool	6.71	1110	0.68	0.79	1485	8.02	Monoterp. alcohol
Nonanal	6.80	1113	0.07	1.59	1339	5.35*	Aliphatic aldehyde
endo-Fenchol	7.15	1126	0.06	0.93	1510	8.62*	Monoterp. alcohol
<i>trans</i> -Pinocarveol	7.62	1143	0.04	0.14	1563	10.16*	Monoterp. alcohol
Isoamyl angelate	7.90	1153	1.61	[1.59]	1339	5.35*	Aliphatic ester
Borneol	8.64	1180	0.07	0.78	1610	11.89*	Monoterp. alcohol
Terpinen-4-ol	8.81	1187	0.26	0.99	1530	9.07*	Monoterp. alcohol
Dimethyl octanedione isomer	8.89	1189	0.23	0.19	1534	9.19	β -diketone
4,6-Dimethyl-3,5-	8.95	1192	0.26	0.19	1541	9.38	β -diketone

octanedione							
α -Terpineol	9.47	1207	0.26	0.43	1618	12.19*	Monoterp. alcohol
Unknown (m/z = 81, 168 (64), 67 (59), 140 (49) 41 (46))	9.82	1214	0.05				β -diketone
Unknown (m/z = 81, 168 (53), 67 (49), 140 (47), 41 (44))	10.45	1228	0.29				β -diketone
Nerol	10.59	1231	0.52	1.17	1724	17.25*	Monoterp. alcohol
Neral	11.38	1249	0.10	1.81	1596	11.38*	Monoterp. aldehyde
3-Methylamyl angelate	11.63	1254	0.10	2.84	1438	6.92*	Aliphatic ester
Hexyl angelate	13.28	1291	0.43	[0.78]	1610	11.89*	Aliphatic ester
α -Ylangene	17.19	1353	0.31	0.42	1426	6.69*	Sesquiterpene
Cyclosativene	17.29	1355	0.18	[2.84]	1438	6.92*	Sesquiterpene
Isoitalicene	17.79*	1362	2.82	[2.84]	1438	6.92*	Sesquiterpene
α -Copaene	17.79*	1362	[2.82]	[0.42]	1426	6.69*	Sesquiterpene
Neryl acetate	18.06	1367	6.39	6.84	1661	14.05*	Monoterp. ester
Geranyl acetate	19.53	1389	0.16	1.62	1696	15.78*	Monoterp. ester
Italicene	19.78	1393	4.20	4.50	1474	7.78	Sesquiterpene
β -Caryophyllene	20.76*	1406	5.20	4.87	1523	8.91	Sesquiterpene
<i>cis</i> - α -Bergamotene	20.76*	1406	[5.20]	[0.93]	1510	8.62*	Sesquiterpene
<i>trans</i> - α -Bergamotene	22.24	1424	0.74	[0.99]	1530	9.07*	Sesquiterpene
6,9-Guaiadiene	22.64	1429	0.11	[0.99]	1530	9.07*	Sesquiterpene
Italidione I	23.29	1436	1.56	4.10	1802	21.97*	β -diketone
α -Humulene	23.46	1438	0.22	0.40	1588	11.06	Sesquiterpene
allo-Aromadendrene	23.71	1441	0.07	[0.14]	1563	10.16*	Sesquiterpene
α -Acoradiene	24.25	1448	0.41	0.36	1582	10.83	Sesquiterpene
<i>trans</i> - β -Farnesene	24.60	1452	0.52	[0.43]	1618	12.19*	Sesquiterpene
β -Acoradiene	24.87	1455	0.70	[1.81]	1596	11.38*	Sesquiterpene
γ -Selinene	25.23*	1460	1.35	[1.81]	1596	11.38*	Sesquiterpene
Neryl propionate	25.23*	1460	[1.35]	[1.17]	1724	17.25*	Monoterp. ester
Germacrene D	25.55	1463	0.20	17.87	1634	12.75*	Sesquiterpene
α -Amorphene	25.87	1467	0.25	[0.78]	1610	11.89*	Sesquiterpene
γ -Curcumene	26.45	1474	15.88	[17.87]	1634	12.75*	Sesquiterpene
Italidione isomer	26.56*	1476	4.14	0.96	1810	22.49	β -diketone
β -Selinene	26.56*	1476	[4.14]	1.83	1636	12.81*	Sesquiterpene
ar-Curcumene	26.81	1479	1.54	[1.62]	1696	15.78*	Sesquiterpene
Italidione II	27.09*	1482	5.25	[4.10]	1802	21.97*	β -diketone
α -Selinene	27.09*	1482	[5.25]	3.88	1643	13.10	Sesquiterpene
α -Muurolole	27.76	1490	0.26	[17.87]	1634	12.75*	Sesquiterpene
δ -Amorphene	27.90	1492	0.25	[1.83]	1636	12.81*	Sesquiterpene
γ -Cadinene	28.79	1503	0.34	0.61	1672	14.55*	Sesquiterpene
β -Bisabolene	28.99*	1506	1.05	0.17	1652	13.53	Sesquiterpene
β -Curcumene	28.99*	1506	[1.05]	[6.84]	1661	14.05*	Sesquiterpene

Italidione II isomer	29.11	1507	0.35	0.35	1821	23.19	β-diketone
δ-Cadinene	29.45	1512	0.64	0.68	1675	14.74	Sesquiterpene
<i>trans</i> -γ-Bisabolene	30.29	1524	0.16	[0.61]	1672	14.55*	Sesquiterpene
β-Sesquiphellandrene	30.56	1527	0.10	[1.62]	1696	15.78*	Sesquiterpene
<i>trans</i> -α-Bisabolene	31.92	1546	0.08	0.05	1706	16.33	Sesquiterpene
Italicene ether	32.17	1550	0.06				Sesquiterp. ether
Italidione III	33.85	1573	0.40	[4.10]	1802	21.97*	β-diketone
Italidione III isomer	34.12	1577	0.16				β-diketone
Italidione III isomer II	34.21	1578	0.12				β-diketone
Italidione III isomer III	34.43	1581	0.18				β-diketone
Guaiol	35.36	1594	0.06	0.07	2004	34.73	Sesquiterp. alcohol
Italidione III isomer IV	35.77	1600	0.14				β-diketone
Rosifoliol analog?	35.88	1603	0.16	0.14	2017	35.30	Sesquiterp. alcohol
Neryl angelate?	37.00	1630	0.08				Monoterp. ester
β-Eudesmol	37.87	1652	0.06	0.06	2110	38.72	Sesquiterp. alcohol
Selin-11-en-4-α-ol	38.05	1656	0.11	0.12	2132	39.39	Sesquiterp. alcohol
Unknown dione (m/z = 98, 41 (50), 83 (46), 82 (43), 137 (43)... 202 (5), 220 (3), 238 (1), 281 (2))	42.83	1794	0.05				β-diketone
Total identified			97.85%	97.86%			

*: 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 : Faintly yellow liquid

Refractive index : 1.4753 ± 0.0003 (20 °C)

CONCLUSION

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

