

Analysis Hyssop Essential Oil

Laboratoire
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SAMPLE IDENTIFICATION

Internal code : 17B16-FSE16-1-DM

Customer identification : Hyssop - Lot #BX/2016

Type : Essential oil

Source : *Hyssopus officinalis*

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).

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Analysis date : 2017-02-28

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. | |
| <i>cis</i> -Hex-3-en-1-ol | 2.49 | 866 | 0.01 | 0.01 | 1335 | 5.86 | Aliphatic alcohol |
| Hexanol | 2.59 | 873 | 0.02 | 0.02 | 1300 | 5.28 | Aliphatic alcohol |
| Tricyclene | 3.18* | 915 | 0.09 | 0.04 | 925 | 1.10 | Monoterpene |
| Hashishene | 3.18* | 915 | [0.09] | 0.26 | 960 | 1.25* | Monoterpene |
| α -Thujene | 3.29 | 921 | 0.23 | [0.26] | 960 | 1.25* | Monoterpene |
| α -Pinene | 3.40 | 928 | 2.51 | 2.47 | 950 | 1.21 | Monoterpene |
| Camphene | 3.68* | 944 | 0.04 | 0.03 | 996 | 1.50 | Monoterpene |
| α -Fenchene | 3.68* | 944 | [0.04] | 0.01 | 976 | 1.33 | Monoterpene |
| Thuja-2,4(10)-diene | 3.76 | 949 | 0.03 | 2.71 | 1058 | 2.06* | Monoterpene |
| Sabinene | 4.11 | 970 | 2.77 | [2.71] | 1058 | 2.06* | Monoterpene |
| β -Pinene | 4.18 | 974 | 7.60 | 7.43 | 1041 | 1.90 | Monoterpene |
| Myrcene | 4.45* | 990 | 2.21 | 2.07 | 1115 | 2.64 | Monoterpene |
| Octen-3-ol | 4.45* | 990 | [2.21] | 0.13 | 1396 | 6.84 | Aliphatic alcohol |
| Octan-3-one | 4.48 | 992 | 0.16 | 0.81 | 1208 | 3.89* | Aliphatic ketone |
| Octan-3-ol | 4.66 | 1002 | 0.05 | 0.07 | 1341 | 5.95 | Aliphatic alcohol |
| α -Phellandrene | 4.71 | 1005 | 0.04 | 0.05 | 1111 | 2.58 | Monoterpene |
| α -Terpinene | 4.90 | 1016 | 0.23 | 0.22 | 1122 | 2.73 | Monoterpene |
| para-Cymene | 5.10 | 1026 | 0.18 | [0.81] | 1208 | 3.89* | Monoterpene |
| Limonene | 5.15 | 1029 | 2.41 | 63.47 | 1155 | 3.17* | Monoterpene |
| 1,8-Cineole | 5.28 | 1036 | 60.34 | [63.47] | 1155 | 3.17* | Monoterp. ether |
| <i>cis</i> - β -Ocimene | 5.32 | 1039 | 2.17 | 2.20 | 1187 | 3.59 | Monoterpene |
| <i>trans</i> - β -Ocimene | 5.50 | 1048 | 2.17 | 2.12 | 1201 | 3.80 | Monoterpene |
| γ -Terpinene | 5.67 | 1058 | 0.64 | 0.54 | 1189 | 3.62 | Monoterpene |
| <i>cis</i> -Sabinene hydrate | 5.96 | 1073 | 0.22 | 0.22 | 1402 | 6.99 | Monoterp. alcohol |
| Terpinolene | 6.14 | 1083 | 0.22 | 0.22 | 1221 | 4.10 | Monoterpene |
| Linalool | 6.56* | 1104 | 0.26 | 0.10 | 1496 | 9.30 | Monoterp. alcohol |
| <i>trans</i> -Sabinene hydrate | 6.56* | 1104 | [0.26] | 0.10 | 1475 | 8.79 | Monoterp. alcohol |
| <i>cis</i> -Verbenol? | 6.80 | 1113 | 0.01 | 0.01 | 1518 | 10.14 | Monoterp. alcohol |
| allo-Ocimene | 7.08 | 1123 | 0.05 | 0.05 | 1312 | 5.48 | Monoterpene |
| <i>cis</i> -para-Menth-2-en-1-ol | 7.12 | 1125 | 0.06 | 0.26 | 1492 | 9.18* | Monoterp. alcohol |
| <i>trans</i> -Pinocarveol | 7.44 | 1136 | 0.18 | 0.16 | 1563 | 11.84 | Monoterp. alcohol |
| Nopinone | 7.53 | 1140 | 0.08 | | | | Monoterp. ketone |
| <i>trans</i> -Verbenol | 7.78 | 1149 | 0.07 | 0.10 | 1607 | 13.63 | Monoterp. alcohol |
| Pinocamphone | 8.02 | 1158 | 0.08 | 0.08 | 1422 | 7.48 | Monoterp. ketone |
| Pinocarvone | 8.10 | 1160 | 0.03 | 0.02 | 1469 | 8.65 | Monoterp. ketone |
| δ -Terpineol | 8.39 | 1171 | 0.90 | 0.92 | 1595 | 13.02 | Monoterp. alcohol |
| Isopinocampheol | 8.49 | 1175 | 0.22 | [0.26] | 1492 | 9.18* | Monoterp. alcohol |
| Terpinen-4-ol | 8.61 | 1179 | 0.87 | 0.82 | 1522 | 10.28 | Monoterp. alcohol |
| Myrtenal | 8.92 | 1191 | 0.05 | 0.05 | 1527 | 10.45 | Monoterp. aldehyde |
| Myrtenol | 9.04 | 1195 | 0.13 | 0.12 | 1700 | 18.67 | Monoterp. alcohol |
| α -Terpineol | 9.23 | 1201 | 2.78 | 2.48 | 1618 | 14.23 | Monoterp. alcohol |

| | | | | | | | |
|-------------------------|--------|------|---------------|---------------|-------|-------|---------------------|
| <i>trans</i> -Carveol | 10.47 | 1229 | 0.03 | 0.04 | 1747 | 21.84 | Monoterp. alcohol |
| Carvone | 11.15 | 1244 | 0.05 | 0.06 | 1646 | 15.74 | Monoterp. ketone |
| Linalyl acetate | 11.26 | 1246 | 0.04 | 0.03 | 1500* | 9.44 | Monoterp. ester |
| Safrrole | 13.21 | 1290 | 0.08 | 0.11 | 1756 | 22.44 | Phenylpropanoid |
| Limonen-10-ol | 13.48 | 1296 | 0.42 | 0.43 | 1897 | 32.53 | Monoterp. alcohol |
| Heliotropine | 16.21 | 1338 | 0.04 | 0.04 | 2098 | 40.38 | Synthetic |
| β-Bourbonene | 17.86 | 1363 | 0.44 | 0.44 | 1443 | 7.99 | Sesquiterpene |
| 1,5-diepi-β-Bourbonene | 17.98 | 1365 | 0.02 | 0.02 | 1467 | 8.58 | Sesquiterpene |
| β-Elementene | 18.62 | 1375 | 0.13 | 0.14 | 1514 | 9.97 | Sesquiterpene |
| β-Caryophyllene | 20.27 | 1400 | 0.32 | 0.34 | 1510 | 9.84 | Sesquiterpene |
| β-Copaene | 21.23* | 1412 | 3.57 | 0.12 | 1523 | 10.33 | Sesquiterpene |
| Limonen-10-yl acetate | 21.23* | 1412 | [3.57] | 3.60 | 1760 | 22.70 | Monoterp. ester |
| α-Humulene | 23.01 | 1433 | 0.06 | 0.07 | 1572 | 12.18 | Sesquiterpene |
| allo-Aromadendrene | 23.28 | 1436 | 0.18 | 0.26 | 1550 | 11.36 | Sesquiterpene |
| Germacrene D | 25.21 | 1459 | 1.43 | 1.46 | 1611 | 13.88 | Sesquiterpene |
| Bicyclogermacrene | 26.42 | 1474 | 0.39 | 0.37 | 1631 | 14.93 | Sesquiterpene |
| α-Muurolene | 27.18 | 1483 | 0.02 | 0.02 | 1634 | 15.10 | Sesquiterpene |
| γ-Cadinene | 28.18 | 1495 | 0.04 | 0.04 | 1656 | 16.31 | Sesquiterpene |
| δ-Cadinene | 28.85 | 1504 | 0.08 | 0.09 | 1662 | 16.63 | Sesquiterpene |
| Spathulenol | 33.36 | 1566 | 0.13 | 0.08 | 2008 | 37.52 | Sesquiterp. alcohol |
| Globulol | 33.80 | 1573 | 0.09 | 0.08 | 1959 | 35.45 | Sesquiterp. alcohol |
| Viridiflorol | 34.29 | 1579 | 0.15 | 0.15 | 1967 | 35.81 | Sesquiterp. alcohol |
| Ledol | 34.78 | 1586 | 0.04 | 0.03 | 1899 | 32.70 | Sesquiterp. alcohol |
| Total identified | | | 97.86% | 98.39% | | | |

*: 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: 1.4670 ± 0.0003 (20 °C)



