

Date : July 20, 2017

SAMPLE IDENTIFICATION

Internal code : 17G11-PTH5

Customer identification : Clary Sage Organic - France - CC410016R

Type : Essential oil

Source : *Salvia sclarea*

Customer : Plant Therapy

ANALYSIS

Method : PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

Analyst : Benoit Roger Ph. D.

Analysis date : 2017-07-18

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 | 0.08 | 0.06 | 1315 | 4.99 | Aliphatic alcohol |
| <i>trans</i> -Hex-2-en-1-ol | 2.66 | 879 | 0.06 | 0.05 | 1340 | 5.36* | Aliphatic alcohol |
| Hexanol | 2.73 | 884 | 0.03 | 0.02 | 1292 | 4.66 | Aliphatic alcohol |
| α -Pinene | 3.43 | 930 | 0.10 | 0.09 | 940 | 1.01 | Monoterpene |
| Camphene | 3.72 | 947 | 0.02 | 0.02 | 996 | 1.26 | Monoterpene |
| Sabinene | 4.15 | 972 | 0.06 | 0.05 | 1057 | 1.73 | Monoterpene |
| β -Pinene | 4.21 | 976 | 0.11 | 0.10 | 1040 | 1.58 | Monoterpene |
| Myrcene | 4.49* | 993 | 0.57 | 0.45 | 1112 | 2.26 | Monoterpene |
| Octen-3-ol | 4.49* | 993 | [0.57] | 0.04 | 1398 | 6.26 | Aliphatic alcohol |
| Octan-3-ol | 4.79 | 1010 | 0.05 | [0.05] | 1340 | 5.36* | Aliphatic alcohol |
| para-Cymene | 5.15 | 1029 | 0.02 | 0.33 | 1197 | 3.33* | Monoterpene |
| Limonene | 5.18 | 1031 | 0.17 | 0.17 | 1138 | 2.57 | Monoterpene |
| 1,8-Cineole | 5.25 | 1035 | 0.02 | 0.07 | 1149 | 2.71 | Monoterp. ether |
| <i>cis</i> - β -Ocimene | 5.36 | 1041 | 0.21 | 0.25 | 1182 | 3.13* | Monoterpene |
| <i>trans</i> - β -Ocimene | 5.55 | 1051 | 0.33 | [0.33] | 1197 | 3.33* | Monoterpene |
| γ -Terpinene | 5.73 | 1061 | 0.02 | [0.25] | 1182 | 3.13* | Monoterpene |
| <i>cis</i> -Linalool oxide (fur.) | 6.01 | 1077 | 0.03 | 0.02 | 1370 | 5.82 | Monoterp. alcohol |
| Terpinolene | 6.21 | 1087 | 0.06 | 0.06 | 1219 | 3.62 | Monoterpene |
| <i>trans</i> -Linalool oxide (fur.) | 6.33 | 1094 | 0.03 | 0.02 | 1397 | 6.23 | Monoterp. alcohol |
| Linalool | 6.80 | 1113 | 17.71 | 17.52 | 1489 | 8.12* | Monoterp. alcohol |
| Borneol | 8.64 | 1180 | 0.04 | 0.05 | 1610 | 11.88 | Monoterp. alcohol |
| Terpinen-4-ol | 8.81 | 1187 | 0.02 | 1.34 | 1522 | 8.88* | Monoterp. alcohol |
| α -Terpineol | 9.53 | 1208 | 1.36 | 1.23 | 1619 | 12.21 | Monoterp. alcohol |
| γ -Terpineol | 9.85 | 1215 | 0.25 | 2.61 | 1622 | 12.35* | Monoterp. alcohol |
| Linalyl formate | 10.41 | 1227 | 0.02 | 0.16 | 1459 | 7.40* | Monoterp. ester |
| Nerol | 10.75 | 1235 | 0.28 | 0.36 | 1724 | 17.26 | Monoterp. alcohol |
| Linalyl acetate | 11.78 | 1258 | 67.74 | 69.12 | 1506 | 8.52 | Monoterp. ester |
| Geraniol | 11.91 | 1261 | 0.76 | 0.72 | 1778 | 20.37 | Monoterp. alcohol |
| Bornyl acetate | 12.99 | 1285 | 0.04 | 0.22 | 1515 | 8.73* | Monoterp. ester |
| Geranyl formate | 14.09 | 1306 | 0.05 | 0.03 | 1633 | 12.71 | Monoterp. ester |
| α -Cubebene | 16.02 | 1336 | 0.02 | 0.02 | 1413 | 6.48 | Sesquiterpene |
| α -Terpinyl acetate | 16.58 | 1344 | 0.08 | [2.61] | 1622 | 12.35* | Monoterp. ester |
| α -Copaene | 17.75 | 1362 | 0.51 | 0.51 | 1440 | 6.97 | Sesquiterpene |
| Neryl acetate | 17.91 | 1364 | 0.50 | 0.61 | 1658 | 13.85* | Monoterp. ester |
| β -Bourbonene | 18.18 | 1368 | 0.17 | [0.16] | 1459 | 7.40* | Sesquiterpene |
| β -Cubebene | 18.73 | 1377 | 0.14 | [17.52] | 1489 | 8.12* | Sesquiterpene |
| β -Elemene | 18.97 | 1380 | 0.09 | [1.34] | 1522 | 8.88* | Sesquiterpene |
| Geranyl acetate | 19.42 | 1387 | 1.00 | 1.00 | 1688 | 15.36 | Monoterp. ester |
| β -Caryophyllene | 20.66 | 1405 | 1.26 | [1.34] | 1522 | 8.88* | Sesquiterpene |
| β -Copaene | 21.56 | 1416 | 0.04 | [0.22] | 1515 | 8.73* | Sesquiterpene |
| Aromadendrene | 22.03 | 1421 | 0.04 | [1.34] | 1522 | 8.88* | Sesquiterpene |

| | | | | | | | |
|-------------------------|-------|------|---------------|---------------|------|--------|---------------------|
| α-Humulene | 23.43 | 1438 | 0.05 | 0.05 | 1580 | 10.81 | Sesquiterpene |
| Germacrene D | 25.70 | 1465 | 2.29 | [2.61] | 1622 | 12.35* | Sesquiterpene |
| β-Selinene | 26.32 | 1473 | 0.23 | [2.61] | 1622 | 12.35* | Sesquiterpene |
| Bicyclogermacrene | 26.89 | 1480 | 0.15 | 0.11 | 1645 | 13.17 | Sesquiterpene |
| Valencene | 27.81 | 1491 | 0.07 | [0.61] | 1658 | 13.85* | Sesquiterpene |
| γ-Cadinene | 28.51 | 1499 | 0.05 | 0.05 | 1666 | 14.23 | Sesquiterpene |
| (E,E)-α-Farnesene | 29.14 | 1508 | 0.16 | 0.09 | 1692 | 15.58 | Sesquiterpene |
| δ-Cadinene | 29.38 | 1511 | 0.09 | 0.13 | 1674 | 14.67 | Sesquiterpene |
| Caryophyllene oxide | 33.83 | 1573 | 0.27 | 0.20 | 1848 | 24.95 | Sesquiterp. ether |
| Spathulenol | 33.95 | 1575 | 0.13 | 0.11 | 2021 | 35.51 | Sesquiterp. alcohol |
| Humulene epoxide II | 35.08 | 1590 | 0.10 | 0.08 | 1901 | 28.68 | Sesquiterp. ether |
| β-Eudesmol | 37.86 | 1651 | 0.09 | 0.08 | 2110 | 38.72 | Sesquiterp. alcohol |
| Bulnesol | 38.39 | 1664 | 0.04 | 0.04 | 2118 | 38.98 | Sesquiterp. alcohol |
| Sclareoloxide | 44.90 | 1868 | 0.16 | 0.12 | 2097 | 38.32 | Diterp. ether |
| Manool | 49.39 | 2049 | 0.04 | 0.06 | 2541 | 48.79 | Diterp. alcohol |
| Sclareol | 53.21 | 2221 | 0.61 | 0.66 | 2974 | 56.52 | Diterp. alcohol |
| Total identified | | | 98.62% | 99.08% | | | |

*: 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

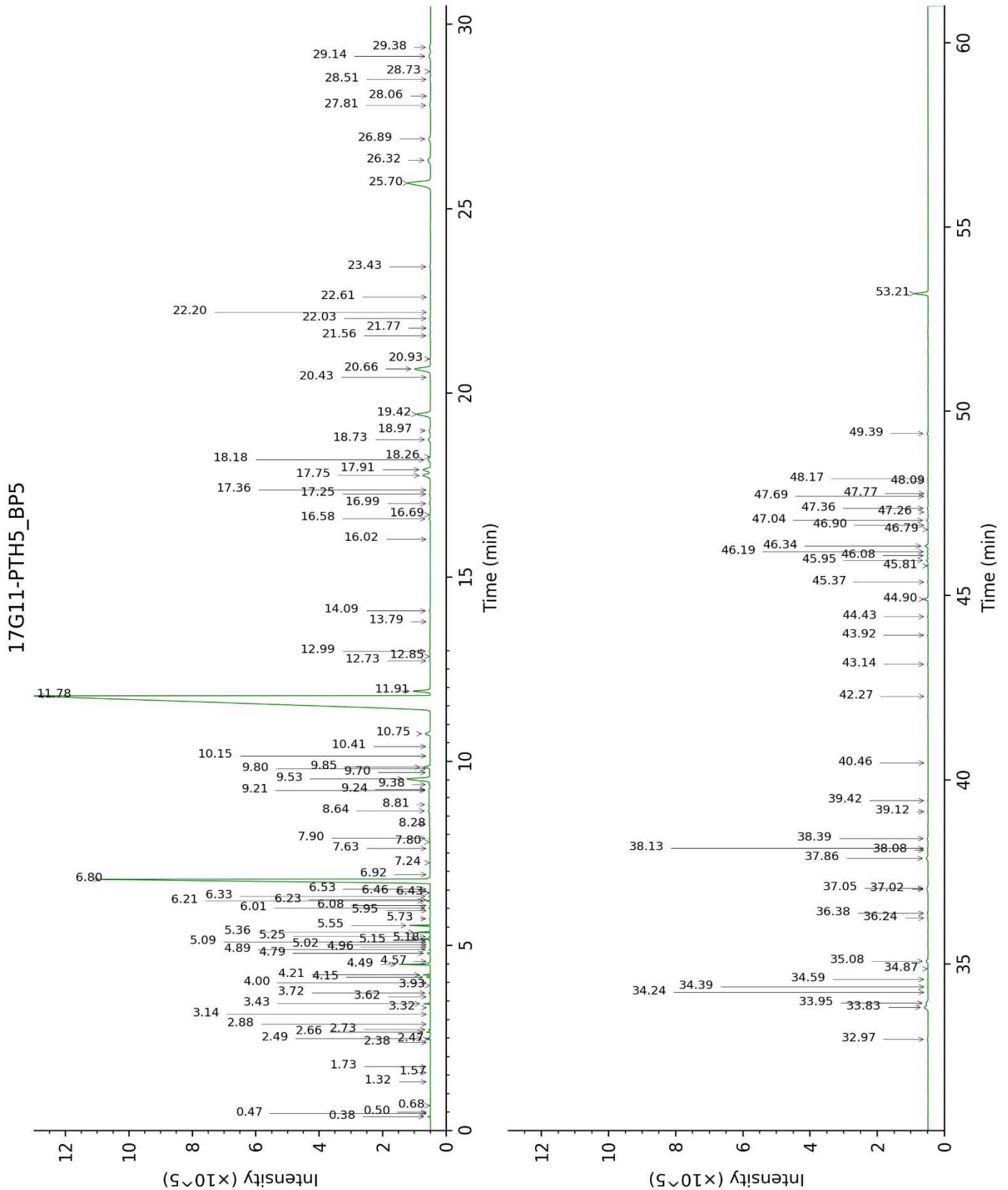
OTHER DATA

Physical aspect : Clear liquid

Refractive index : 1.4575 ± 0.0003 (20 °C)

CONCLUSION

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



17G11-PTH5_WAX

