**Table 2.** Qualitative detection of volatile compounds in all samples by GC-IMS.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Compounds** | **CAS#** | **Formula** | **MW** | **RI** | **Retention(s)** | **DT(ms)** | **Relative content** | | | | | |
| **CK** | **A** | **B** | **C** | **D** | **E** |  |
| Phenylacetaldehyde | C122781 | C8H8O | 120,2 | 1046,0 | 440,215 | 154,093 | 0.16±0.01a | 0.03±0c | 0.04±0.01b | 0.04±0.01b | 0.04±0.01b | 0.04±0.01b |  |
| 3-methylthiopropanal | C3268493 | C4H8OS | 104,2 | 908,9 | 283,801 | 109,067 | 0.11±0.04c | 0.07±0.01d | 0.14±0.02b | 0.10±0.01c | 0.24±0.03a | 0.10±0.01c |  |
| Heptanal | C111717 | C7H14O | 114,2 | 902,1 | 278,14 | 169,604 | 0.03±0.01f | 0.08±0.02d | 0.14±0.04b | 0.04±0.01e | 0.22±0.01a | 0.11±0.01c |  |
| 2-Methyl-2-pentenal | C623369 | C6H10O | 98,1 | 836,7 | 235,456 | 149,453 | 0.29±0.10a | 0.06±0.02c | 0.09±0.01b | 0.08±0.01bc | 0.04±0.01d | 0.04±0.01d |  |
| (E)-2-pentenal | C1576870 | C5H8O | 84,1 | 751,7 | 190,716 | 111,657 | 0.04±0.01e | 0.08±0.03b | 0.11±0.01a | 0.03±0.01f | 0.06±0.01c | 0.05±0d |  |
| 3-methylbutanal | C590863 | C5H10O | 86,1 | 656,8 | 153,612 | 140,305 | 12.08±0.23b | 13.72±0.73a | 2.58±0.45e | 9.54±0.63d | 11.79±0.92c | 11.91±0.82c |  |
| Butanal | C123728 | C4H8O | 72,1 | 607,0 | 139,918 | 109,892 | 0.24±0.07e | 0.64±0.06b | 0.41±0.02c | 1.09±0.42a | 0.25±0.01e | 0.37±0.01d |  |
| 2-Methyl-2-propenal | C78853 | C4H6O | 70,1 | 574,0 | 131,526 | 105,954 | 2.69±0.14d | 3.44±0.28bc | 4.16±0.26a | 0.15±0.01e | 3.16±0.1c | 3.35±0.10b |  |
| 2-methylpropanal | C78842 | C4H8O | 72,1 | 542,7 | 124,017 | 129,308 | 0.33±0.16d | 2.20±0.39a | 0.24±0.03c | 0.15±0.01e | 0.96±0.28b | 0.97±0.22b |  |
| Acroleine | C107028 | C3H4O | 56,1 | 482,4 | 110,765 | 118,038 | 0.44±0.07a | 0.29±0.01d | 0.33±0.03c | 0.19±0.04e | 0.36±0.06bc | 0.39±0.01b |  |
| Methyl-5-hepten-2-one | C110930 | C8H14O | 126,2 | 987,6 | 357,857 | 116,371 | 0.24±0.03d | 0.38±0.03b | 0.49±0.05a | 0.18±0.03f | 0.37±0.01c | 0.29±0.02e |  |
| 2-heptanone | C110430 | C7H14O | 114,2 | 892,7 | 270,552 | 162,852 | 0.09±0.01c | 0.10±0.01b | 0.12±0.01ab | 0.05±0.01d | 0.13±0.01a | 0.12±0.01ab |  |
| Mesityl oxide | C141797 | C6H10O | 98,1 | 796,2 | 213,008 | 143,755 | 0.27±0.11b | 0.11±0.03e | 0.21±0.01c | 0.85±0.22a | 0.15±0.01d | 0.11±0.01e |  |
| 2-Hexanone | C591786 | C6H12O | 100,2 | 781,0 | 205,103 | 119,383 | 0.20±0.01cd | 0.17±0.01d | 0.26±0.01b | 0.20±0.01cd | 0.33±0.02a | 0.21±0.02c |  |
| Hydroxyacetone | C116096 | C3H6O2 | 74,1 | 712,6 | 173,047 | 122,926 | 1.46±0.13b | 0.57±0.21f | 0.78±0.01e | 1.94±0.11a | 1.21±0.12d | 1.26±0.02c |  |
| 3-hydroxybutan-2-one | C513860 | C4H8O2 | 88,1 | 715,1 | 174,151 | 133,245 | 9.13±0.41b | 5.04±1.23e | 5.2±0.61d | 12.55±1.39a | 3.52±0.32f | 5.53±0.17c |  |
| 2-Pentanone | C107879 | C5H10O | 86,1 | 686,7 | 162,446 | 137,182 | 2.63±1.01a | 0.57±0.11f | 1.4±0.08b | 0.62±0.13e | 0.94±0.05c | 0.72±0.1d |  |
| 1-penten-3-one | C1629589 | C5H8O | 84,1 | 682,3 | 161,121 | 132,566 | 0.27±0.02d | 1.49±0.56a | 0.75±0.07b | 0.15±0.02e | 0.45±0.04c | 0.73±0.03bc |  |
| 3-Pentanone | C96220 | C5H10O | 86,1 | 688,1 | 162,888 | 1,122 | 1.53±0.20ab | 1.56±0.13a | 0.76±0.08e | 1.06±0.15d | 1.12±0.09c | 1.34±0.06b |  |
| 2-Butanone | C78933 | C4H8O | 72,1 | 581,1 | 133,293 | 124,555 | 8.98±0.51a | 6.67±0.80d | 7.87±0.46b | 5.06±2.23e | 5.25±0.69 | 7.06±1.01c |  |
| Acetone | C67641 | C3H6O | 58,1 | 537,9 | 122,912 | 111,928 | 2.30±0.90f | 5.40±0.32a | 3.88±0.19b | 2.45±0.36e | 2.77±0.28d | 3.59±0.25c |  |
| Methyl butanoate | C623427 | C5H10O2 | 102,1 | 990,7 | 361,192 | 143,989 | 0.08±0.01d | 0.62±0.08bc | 0.71±0.10a | 0.09±0.01d | 0.63±0.02b | 0.45±0.02c |  |
| Acetic acid hexyl ester | C142927 | C8H16O2 | 144,2 | 1008,4 | 383,699 | 141,853 | 0.09±0.02f | 0.30±0.07d | 0.43±0.04b | 0.11±0.01e | 0.50±0.03a | 0.33±0.01c |  |
| Isobutyl butyrate | C539902 | C8H16O2 | 144,2 | 951,4 | 321,595 | 135,162 | 0.23±0.08b | 0.05±0.01e | 0.08±0.01c | 0.28±0.17a | 0.07±0.01d | 0.08±0.01c |  |
| Propyl butanoate | C105668 | C7H14O2 | 130,2 | 893,9 | 271,5 | 126,558 | 0.70±0.31c | 0.25±0.03d | 0.22±0.01e | 0.17±0.01f | 1.04±0.09a | 0.84±0.01b |  |
| 1-methoxy-2-propyl acetate | C108656 | C6H12O3 | 132,2 | 859,4 | 249,052 | 115,479 | 0.34±0.04b | 0.10±0.03e | 0.10±0.01e | 0.39±0.08a | 0.28±0.04c | 0.20±0.01d |  |
| Butyl formate | C592847 | C5H10O2 | 102,1 | 738,4 | 184,532 | 120,075 | 0.12±0.02e | 0.16±0.01c | 0.29±0.01b | 0.13±0.02d | 0.50±0.03a | 0.29±0.01b |  |
| n-Propyl acetate | C109604 | C5H10O2 | 102,1 | 718,7 | 175,697 | 11,668 | 7.30±1.85c | 4.60±1.08f | 6.01±0.53e | 6.43±1.53d | 10.04±0.83a | 8.33±0.11b |  |
| Ethyl acrylate | C140885 | C5H8O2 | 100,1 | 693,1 | 164,875 | 143,292 | 0.06±0.02e | 0.21±0.03d | 1.38±0.28a | 0.06±0.02e | 1.28±0.05b | 0.31±0.03c |  |
| Acetic acid ethyl ester | C141786 | C4H8O2 | 88,1 | 607,0 | 139,918 | 133,924 | 0.34±0.11c | 0.38±0.15b | 0.15±0.02d | 1.07±0.54a | 0.08±0.01f | 0.10±0.01e |  |
| Ethyl formate | C109944 | C3H6O2 | 74,1 | 622,0 | 143,894 | 106,633 | 0.69±0.10f | 1.29±0.12b | 1.11±0.19c | 1.62±0.26a | 0.88±0.03e | 1.06±0.01d |  |
| Propyl propanoate | C106365 | C6H12O2 | 116,2 | 798,0 | 213,956 | 122,126 | 1.36±0.41a | 0.30±0.02f | 0.39±0.03e | 0.62±0.18b | 0.50±0.05c | 0.44±0.02d |  |
| Pentanoic acid | C109524 | C5H10O2 | 102,1 | 909,0 | 283,831 | 12,181 | 0.05±0.01bc | 0.03±0.01d | 0.06±0.01b | 0.04±0.01c | 0.18±0.01a | 0.06±0.01b |  |
| 3-methylbutanoic acid | C503742 | C5H10O2 | 102,1 | 848,5 | 242,412 | 121,493 | 0.72±0.15a | 0.17±0.13c | 0.14±0.01e | 0.38±0.05b | 0.15±0.04d | 0.14±0.01e |  |
| Butanoic acid | C107926 | C4H8O2 | 88,1 | 808,6 | 219,647 | 116,218 | 0.94±0.08c | 0.40±0.11f | 0.46±0.02e | 1.36±0.24a | 1.27±0.22b | 0.77±0.12d |  |
| Propanoic acid | C79094 | C3H6O2 | 74,1 | 690,9 | 163,992 | 127,271 | 0.24±0.11d | 0.14±0.01e | 0.48±0.02b | 0.14±0.08e | 0.89±0.11a | 0.31±0.01c |  |
| Acetic acid | C64197 | C2H4O2 | 60,1 | 626,9 | 145,219 | 114,101 | 0.88±0.28b | 0.42±0.10e | 0.61±0.12d | 0.68±0.27c | 1.04±0.09a | 0.87±0.02bc |  |
| Formic acid | C64186 | CH2O2 | 46,0 | 522,3 | 119,379 | 104,732 | 1.18±0.52e | 1.65±0.13c | 3.54±0.29b | 3.78±1.31a | 0.93±0.14f | 1.43±0.04d |  |
| 2-furanmethanethiol | C98022 | C5H6OS | 114,2 | 903,6 | 279,405 | 134,154 | 0.13±0.03d | 0.55±0.12c | 0.82±0.12b | 0.11±0.03e | 1.21±0.04a | 0.81±0.01bc |  |
| Heptan-2-ol | C543497 | C7H16O | 116,2 | 892,7 | 270,552 | 136,053 | 0.39±0.17c | 0.10±0.01e | 0.12±0.01d | 0.08±0.02f | 0.75±0.04a | 0.50±0.02b |  |
| n-Hexanol | C111273 | C6H14O | 102,2 | 873,5 | 257,905 | 132,782 | 0.15±0.02e | 0.94±0.21a | 0.25±0.02c | 0.19±0.03d | 0.18±0.01de | 0.29±0.01b |  |
| Cyclohexanol | C108930 | C6H12O | 100,2 | 873,0 | 257,588 | 164,857 | 0.03±0.01d | 0.23±0.12a | 0.05±0.01b | 0.04±0.01c | 0.04±0.01c | 0.04±0.01c |  |
| (E)-3-hexen-1-ol | C928972 | C6H12O | 100,2 | 837,2 | 235,772 | 12,297 | 1.09±0.17a | 0.36±0.28c | 0.16±0.01e | 0.60±0.06b | 0.18±0.04d | 0.18±0.03d |  |
| 2-Hexanol | C626937 | C6H14O | 102,2 | 794,4 | 212,059 | 128,246 | 0.46±0.07f | 2.36±0.11c | 2.94±0.10a | 0.61±0.12e | 2.55±0.09b | 2.28±0.04d |  |
| Methyl-3-but-3-en-1-ol | C763326 | C5H10O | 86,1 | 733,6 | 182,323 | 140,713 | 4.95±0.42b | 2.47±0.14c | 1.53±0.07d | 5.53±0.23a | 0.62±0.05f | 1.38±0.07e |  |
| 1-Pentanol | C71410 | C5H12O | 88,1 | 763,2 | 196,237 | 151,982 | 0.06±0.01d | 0.36±0.11bc | 0.40±0.08a | 0.04±0.01e | 0.37±0.03b | 0.34±0.01c |  |
| 3-methylbutanol | C123513 | C5H12O | 88,1 | 734,1 | 182,544 | 150,624 | 3.82±0.36a | 1.90±0.71c | 1.01±0.17d | 2.17±0.75b | 0.28±0.01f | 0.70±0.04e |  |
| 1,2-Propanediol | C57556 | C3H8O2 | 76,1 | 735,5 | 183,207 | 128,357 | 0.58±0.13b | 0.48±0.03cd | 0.54±0.04c | 0.64±0.06a | 0.42±0.01e | 0.46±0.03d |  |
| Ethylsulfide | C352932 | C4H10S | 90,2 | 710,0 | 171,943 | 107,448 | 1.82±0.11d | 2.88±0.29bc | 3.08±0.11a | 2.25±0.05c | 2.99±0.12b | 3.08±0.08a |  |
| 3-Methyl-2-butanol | C598754 | C5H12O | 88,1 | 688,8 | 163,109 | 122,655 | 1.03±0.30d | 0.64±0.11f | 1.74±0.13b | 0.75±0.22e | 2.22±0.19a | 1.29±0.04c |  |
| 1-butanol | C71363 | C4H10O | 74,1 | 668,2 | 156,925 | 117,631 | 0.87±0.05e | 1.21±0.06c | 1.02±0.06d | 1.62±0.18a | 1.23±0.14bc | 1.25±0.03b |  |
| 2-Butanol | C78922 | C4H10O | 74,1 | 635,7 | 147,648 | 132,295 | 1.08±0.10b | 1.16±0.05a | 0.60±0.06d | 1.05±0.06bc | 0.78±0.06cd | 0.92±0.05c |  |
| 2-methylpropanol | C78831 | C4H10O | 74,1 | 616,2 | 142,348 | 137,182 | 0.46±0.14a | 0.10±0.04bc | 0.06±0.01c | 0.11±0.01b | 0.05±0.01d | 0.05±0.01d |  |
| 1-Propanethiol | C107039 | C3H8S | 76,2 | 615,4 | 142,127 | 117,359 | 1.34±0.17a | 0.85±0.28b | 0.74±0.05c | 0.55±0.15f | 0.69±0.03d | 0.65±0.03e |  |
| 2-Propanethiol | C75332 | C3H8S | 76,2 | 576,7 | 132,188 | 115,866 | 2.19±0.70c | 1.40±0.38e | 1.99±0.36d | 1.90±0.74de | 4.66±0.54a | 3.49±0.01b |  |
| β-Pinene | C127913 | C10H16 | 136,2 | 964,7 | 334,516 | 129,041 | 0.06±0.01d | 0.08±0.02c | 0.18±0.02bc | 0.06±0.01d | 0.44±0.01a | 0.20±0.01b |  |
| 1-Pentene | C109671 | C5H10 | 70,1 | 482,4 | 110,765 | 111,249 | 5.76±0.23c | 2.58±0.03e | 4.17±0.16d | 2.40±0.30f | 6.66±0.69b | 7.43±0.59a |  |
| Styrene | C100425 | C8H8 | 104,2 | 902,1 | 278,14 | 140,907 | 0.05±0.01d | 0.16±0.04c | 0.31±0.02bc | 0.06±0.01d | 0.63±0.04a | 0.34±0.01b |  |
| Dipropyl disulfide | C629196 | C6H14S2 | 150,3 | 1105,7 | 547,321 | 148,793 | 0.34±0.08f | 0.56±0.05d | 0.69±0.04c | 0.47±0.17e | 0.97±0.07a | 0.74±0.04b |  |
| Propylsulfide | C111477 | C6H14S | 118,2 | 898,6 | 275,294 | 116,112 | 0.20±0.03c | 0.15±0.02e | 0.20±0.03c | 0.17±0.02d | 0.23±0.02a | 0.21±0.01bc |  |
| Diethylene glycol dimethyl ether | C111966 | C6H14O3 | 134,2 | 964,7 | 334,516 | 115,944 | 0.11±0.01d | 0.20±0.03c | 0.37±0.01b | 0.12±0.01d | 0.61±0.05a | 0.37±0.01b |  |
| 1-propene-3-methylthio | C10152768 | C4H8S | 88,2 | 695,8 | 165,98 | 104,461 | 0.32±0.08d | 0.39±0.04c | 0.41±0.06b | 0.94±0.19a | 0.27±0.01e | 0.38±0.03c |  |
| 4-methylthiazole | C693958 | C4H5NS | 99,2 | 792,6 | 211,111 | 134,787 | 0.28±0.01e | 1.50±0.23d | 2.57±0.15b | 0.47±0.07de | 2.78±0.21a | 1.97±0.07c |  |
| Pyridine | C110861 | C5H5N | 79,1 | 758,6 | 194,029 | 125,098 | 1.46±0.04d | 2.14±0.27a | 1.55±0.08c | 1.65±0.08bc | 1.38±0.03e | 1.71±0.02b |  |
| 1,3-Dioxolane, 2,4-dimethyl, cis | C3390123 | C5H10O2 | 102,1 | 705,9 | 170,176 | 139,355 | 0.34±0.1c | 0.82±0.15a | 0.22±0.03d | 0.62±0.23b | 0.15±0.01f | 0.17±0.02e |  |
| 3-Butenenitrile | C109751 | C4H5N | 67,1 | 656,1 | 153,391 | 126,456 | 1.80±0.47d | 1.46±0.28e | 1.07±0.18f | 2.21±0.44c | 3.79±0.32a | 2.68±0.12b |  |
| Dimethylamine | C124403 | C2H7N | 45,1 | 428,7 | 100,164 | 10,514 | 5.44±3.03e | 11.29±0.32c | 13.51±0.54b | 14.11±2.79a | 3.53±0.14f | 6.62±0.39d |  |
| 1 |  |  |  |  |  |  | 0.19±0.05a | 0.04±0.01b | 0.04±0.01b | 0.04±0.01b | 0.02±0.01d | 0.03±0.01c |  |
| 2 |  |  |  |  |  |  | 0.96±0.16a | 0.21±0.14d | 0.19±0.01e | 0.22±0.14cd | 0.38±0.06b | 0.23±0.04c |  |
| 3 |  |  |  |  |  |  | 0.68±0.18a | 0.21±0.06bc | 0.16±0.01d | 0.22±0.05b | 0.18±0.02c | 0.16±0.02d |  |
| 4 |  |  |  |  |  |  | 1.82±0.29b | 1.88±0.4a | 1.21±0.08c | 0.34±0.03f | 0.41±0.01e | 0.85±0.03d |  |
| 5 |  |  |  |  |  |  | 0.81±0.34d | 1.06±0.16b | 2.76±0.30a | 0.58±0.08f | 0.71±0.08e | 1.05±0.05c |  |
| 6 |  |  |  |  |  |  | 0.10±0.01f | 3.56±0.89c | 7.24±0.77a | 3.25±0.05d | 3.99±0.17b | 2.90±0.26e |  |

Note: 1 DT, drift time; MW, molecular weight; RI, retention index. 2 different types of letters in the same row indicate significant difference (P<0.05)

**Table 3.** Detection of volatile compounds in all samples by GC-MS.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Compound** | **CAS** | **RI** | **CK** | **A** | **B** | **C** | **D** | **E** |
| Hexanal | 66-25-1 | 719 | ND | 13.44±3.04b | 12.37±2.11c | ND | 44.18±1.97a | 11.04±3.83d |
| Isovaleric aldehyde | 590-86-3 | 539 | 6.06±0.36d | 10.19±0.66c | ND | 19.64±4.89b | 20.87±0.13a | ND |
| Nonanal | 124-19-6 | 1094 | 1.99±0.6f | 9.12±1.02d | 12.1±7.14b | 4.43±0.98e | 13.96±4.91a | 11.52±6.02c |
| Tetradecanal | 124-25-4 | 1433 | 1.32±0.04c | 1.27±0.35d | 1.19±0.22f | 1.38±0.22b | 1.26±0.1e | 2.2±2.44a |
| Pentadecanal | 2765-11-9 | 1530 | 0.53±0.17f | 0.9±0.22d | 0.64±0.14e | 1.48±0.43b | 3.59±0.68a | 1.26±0.51c |
| Dodec-(2E)-enal | 20407-84-5 | 1276 | ND | ND | 1.89±0.03a | ND | 0.07±0.01c | 0.15±0.01b |
| Heptadecanal | 629-90-3 | 1714 | 0.42±0.16c | 0.6±0.48b | 0.27±0.02e | 2.43±0a | 0.36±0.11d | 0.27±0.05f |
| Benzaldehyde | 100-52-7 | 1477 | ND | 2.02±0.35b | 0.92±0.51d | 0.53±0.09e | 3.66±0.29a | 1.36±0.56c |
| Undecanal | 112-44-7 | 1171 | 0.36±0.03d | ND | 1.45±0.23b | 0.93±0.04c | ND | 8.27±0.54a |
| Non-(2E)-enal | 18829-56-6 | 1157 | ND | 0.31±0.06d | 0.55±0.47b | 0.84±0.05a | 0.53±0.14c | 0.85±0.78a |
| (2E)-2,4-Undecadienal | 30361-29-6 | 1204 | ND | ND | 0.33±0.13a | ND | ND | ND |
| Oct-(2E)-enal | 2363-89-5 | 1112 | 0.68±0.09a | ND | 0.45±0.2b | 0.42±0.08b | ND | ND |
| Icosanal | 2400-66-0 | 2124 | ND | ND | 0.2±0.13a | ND | ND | ND |
| (E)-2-Heptenal | 18829-55-5 | 1291 | ND | ND | ND | ND | 0.67±0.13a | ND |
| 1-ethenyl-3-ethyl-Benzene | 7525-62-4 | 1088 | ND | 0.66±0.48a | ND | ND | 0.32±0.02b | ND |
| Octanal | 124-13-0 | 1019 | ND | ND | ND | ND | 3.69±0.43a | ND |
| (2E)-Octen-1-al | 2548-87-0 | 1296 | ND | 0.45±0.01b | ND | ND | 0.85±0.02a | 0.39±0.12c |
| (Z)-2-Decenal | 2497-25-8 | 1168 | ND | 0.36±0.10b | ND | 0.37±0.21b | 0.56±0.12a | ND |
| (2E)-2,4-Decadienal | 25152-84-5 | 1002 | ND | 0.24±0.22c | ND | ND | 0.42±0.04b | 1.82±1.67a |
| (E)-Tetradec-2-enal | 51534-36-2 | 1427 | ND | ND | ND | ND | 0.31±0.03a | ND |
| Hexadec-(9Z)-enal | 56219-4-6 | 1960 | ND | ND | ND | 0.43±0.13a | 0.37±0.21b | ND |
| (Z)-7-Tetradecenal | 65128-96-3 | 1445 | ND | ND | ND | ND | 0.36±0.04a | ND |
| (E)-Decenal | 3913-81-3 | 1167 | 0.18±0.01b | ND | ND | ND | ND | 1.42±1.81a |
| Decanal | 112-31-2 | 1129 | ND | ND | ND | 1.24±0.79b | ND | 1.61±0.10a |
|  |  |  |  |  |  |  |  |  |
| 3,5-Octadien-2-one | 38284-27-4 | 1173 | ND | ND | ND | ND | 2.24±0.18a | ND |
| 2,3-Octanedione | 585-25-1 | 1043 | ND | ND | ND | ND | 10.78±0.22a | ND |
| 5-methyl-5-Hepten-3-one | 1190-34-7 | 929 | ND | ND | 0.67±0.05c | 2.6±0.34b | 6.24±0.67a | ND |
| Acetoin | 513-86-0 | 769 | 8.89±4.25b | 4.83±1.75d | 6.44±3.09c | 27.3±3.70a | ND | 2.69±0.91e |
| Sageone | 142546-15-4 | 1985 | 4.63±0.75a | 2.4±0.65b | 3.72±0.32ab | 2.02±0.02c | ND | 1.37±0.05bc |
| 6,10-dimethyl-5,9-Undecadien-2-one | 689-67-8 | 1345 | 0.36±0.07b | ND | ND | 0.28±0.01c | ND | 2.61±0.2a |
| 2-Tridecanone | 593-08-8 | 1656 | ND | ND | ND | ND | ND | 0.14±0a |
| Tridecan-2-one | 593-8-8 | 1197 | 2.15±0.07a | ND | ND | ND | ND | ND |
| Heptan-2-one | 110-43-0 | 965 | 3.33±0.48a | ND | ND | 1.62±0.02b | ND | ND |
| 2-Undecanone | 112-12-9 | 1191 | 2.89±0.76a | ND | ND | ND | ND | ND |
| 2-Nonanone | 821-55-6 | 1164 | 9.49±2.59a | ND | ND | 1.62±0.24b | ND | ND |
|  |  |  |  |  |  |  |  |  |
| 1-chloro-Octadecane | 3386-33-2 | 1797 | 0.79±0.04a | ND | ND | ND | ND | ND |
| 2,3-diethyl-Oxirane | 4468-66-0 | 798 | ND | ND | ND | ND | ND | 5.69±0.89a |
| Tridecane | 629-50-5 | 1190 | ND | ND | ND | ND | ND | 1.88±1.22a |
| Tetradecane | 629-59-4 | 1403 | 1.6±0.12c | ND | 2.65±0.26a | ND | ND | 2.3±3.31b |
| Pentadecane | 629-62-9 | 1478 | 1.78±0.24e | 2.16±0.26d | 2.56±1.07a | 2.28±0.19c | 2.41±0.02b | 2.41±0.98b |
| Hexadecane | 544-76-3 | 1688 | 0.53±0.02e | 1.77±1.25a | 0.97±0.85b | 0.6±0.10d | 0.7±0.08c | ND |
| Heptadecane | 629-78-7 | 1789 | ND | ND | 1.17±0.73c | ND | 1.33±0.21b | 3.8±4.23a |
| Cyclododecane | 294-62-2 | 1221 | ND | ND | 0.66±0.36a | ND | ND | ND |
| Octadecane | 593-45-3 | 1688 | ND | 0.97±0.54a | ND | ND | ND | ND |
| 3-methyl-5-propyl-Nonane | 31081-18-2 | 1302 | ND | 1.63±0.43a | ND | ND | ND | ND |
|  |  |  |  |  |  |  |  |  |
| Farnesol | 4602-84-0 | 1531 | ND | ND | ND | ND | ND | 0.27±0.04a |
| 2-ethyl-Hexanol | 104-76-7 | 1166 | ND | ND | ND | ND | ND | 18.9±0.11a |
| 1-Octen-3-ol | 3391-86-4 | 1136 | ND | 6.9±0.85b | 5.55±1.56c | 7.02±3.42b | 7.17±0.19a | 3.8±0.91d |
| Octanol | 111-87-5 | 1221 | 1.48±0.12a | ND | 0.57±0.1c | 0.83±0.16b | ND | ND |
| Phenylethyl Alcohol | 60-12-8 | 1478 | 10.9±1.67a | 0.67±0.22d | 1.62±0.37c | 4.55±1.68b | 0.34±0.03e | 0.35±0.12e |
| Tridecanol | 112-70-9 | 1434 | ND | ND | ND | ND | 0.55±0.1b | 1.4±0.45a |
| (E)-2-Octen-1-ol, | 18409-17-1 | 1461 | 5.01±0.11a | ND | ND | 1.56±0.27c | 2.02±0.84b | ND |
| (E)-2-Undecenol | 37617-03-1 | 1230 | 2.17±0.32a | ND | ND | ND | ND | 0.43±0.17b |
| 2-methylpropionate4-Hexen-1-ol | 42918-52-5 | 1214 | 0.3±0.18a | ND | ND | ND | ND | ND |
| 1-Nonen-4-ol | 35192-73-5 | 1148 | ND | ND | ND | 1.55±0.11a | ND | ND |
|  |  |  |  |  |  |  |  |  |
| β-Myrcene | 123-35-3 | 1034 | 1.36±0.17b | ND | ND | 3.42±0.05a | ND | ND |
| Limonene | 138-86-3 | 1042 | 137.79±4.23a | ND | ND | ND | ND | ND |
| D-Limonene | 5989-27-5 | 1042 | ND | 33.43±9.4b | 28.75±3.36c | 102.57±6a | 23.76±2.08d | 5.36±5.17e |
| 1,3,5,7-Cyclooctatetraene | 629-20-9 | 1083 | ND | ND | 0.72±0.25b | 3.05±0.04a | ND | ND |
| Tridec-1-ene | 2437-56-1 | 1303 | ND | ND | 0.29±0.02b | ND | ND | 1.01±0.87a |
| Caryophyllene | 87-44-5 | 1505 | ND | 0.6±0.06b | 0.63±0.14b | ND | 0.8±0.01a | ND |
| (Z)-Anethole | 25679-28-1 | 1288 | ND | ND | 0.85±0.3a | ND | ND | ND |
| Styrene | 100-42-5 | 1085 | 2.92±0.87a | 0.61±0.05c | ND | 2.92±0.07a | 1.22±0.08b | ND |
| 1-methyl-4-(1-methylethylidene)-Cyclohexene | 586-62-9 | 1066 | 0.96±0.06a | 0.48±0.08c | ND | ND | 0.55±0.01b | ND |
| Tetradec-1-ene | 1120-36-1 | 1487 | 0.36±0.01b | 3.58±1.91a | ND | ND | 0.38±0.18b | ND |
| Cumene | 98-82-8 | 1103 | ND | 1.31±0.6b | ND | 2.76±0.05a | ND | ND |
| Terpilene | 99-86-5 | 1326 | 7.67±2.38b | 3.36±0.31c | ND | 10.21±1.96a | ND | ND |
| Azulene | 275-51-4 | 1281 | 0.66±0.17b | 0.71±0.03a | ND | 0.68±0.09ab | ND | 0.21±0.11c |
| Squalene | 7683-64-9 | 2998 | 1.84±0.29b | 2.31±0.58a | ND | 1.51±0.39c | ND | ND |
| 3,5,5-trimethyl-2-Hexene | 26456-76-8 | 1138 | 2.09±0.41a | ND | ND | ND | ND | ND |
|  |  |  |  |  |  |  |  |  |
| [Methyl 4-Methyl-2-oxopentanoate](https://www.chemsrc.com/en/cas/3682-43-7_404325.html" \t "https://www.chemsrc.com/cas/_blank) | 3682-43-7 | 1129 | 2.85±0.39a | ND | ND | ND | ND | ND |
| Methyl 2-hydroxy-4-methylvalerate | 40348-72-9 | 1179 | 7.47±0.71a | ND | ND | ND | ND | ND |
| Glycidyl palmitate | 7501-44-2 | 1918 | ND | ND | ND | ND | 0.29±0.05b | 0.32±0.11a |
| [2-Ketocaproic acid methyl ester](https://www.chemsrc.com/en/cas/6395-83-1_117401.html" \t "https://www.chemsrc.com/cas/_blank) | 6395-83-1 | 1079 | ND | ND | 0.43±0a | ND | ND | ND |
| Dimethyl-Phthalate | 131-11-3 | 1256 | ND | 1±0.19d | 1.34±0.21b | 1.66±0.29a | 1.25±0.3c | ND |
| [Diisobutyl phthalate](https://www.chemsrc.com/en/cas/84-69-5_443263.html" \t "https://www.chemsrc.com/cas/_blank) | 84-69-5 | 1626 | 1.57±0.05b | 0.41±0.38e | 0.53±0.14d | 4.84±3.78a | 0.31±0.08f | 1.46±1.49c |
| Dibutyl phthalate | 84-74-2 | 1629 | 0.66±0.19c | ND | 0.62±0.16c | 0.78±0.53b | 0.25±0.05d | 1.08±0.3a |
| 2,2,4-Trimethyl-1,3-pentanediol diisobutyrate | 6846-50-0 | 1609 | ND | ND | ND | 0.38±0.07b | ND | 4.18±0.07a |
| 3,6-Nonadien-1-yl acetate | 76649-26-8 | 1302 | 0.38±0.14a | ND | ND | ND | ND | ND |
| γ-Decalactone | 706-14-9 | 1342 | 1.86±0.71a | ND | ND | 0.48±0.2b | ND | ND |
|  |  |  |  |  |  |  |  |  |
| Acetic acid | 64-19-7 | 974 | ND | ND | 0.69±0.01b | ND | ND | 1.48±0.08a |
| Propionic acid | 79-09-4 | 1075 | ND | ND | 0.71±0.07b | ND | ND | 1.09±0.41a |
| Octanoic acid | 124-7-2 | 1543 | 0.34±0.06b | 0.3±0.04b | 0.75±0.66a | ND | ND | ND |
| Nonanoic acid | 112-5-0 | 1338 | 0.21±0.04f | 0.48±0.38d | 0.54±0.25c | 0.42±0.06e | 1.03±0.13b | 2.63±3.34a |
| Pentadecylic acid | 1002-84-2 | 1654 | ND | ND | 1.86±1.53b | 4.57±1.42a | 1.28±0.01c | 0.34±0.21d |
| Tetradecanoic acid | 544-63-8 | 1457 | 2.06±0.18d | 2.72±0.18b | 2.28±1.26c | 1.6±0.02f | 1.97±0.36e | 3.39±1.95a |
| Pentadecanolide | 106-2-5 | 1544 | ND | ND | ND | ND | ND | 2.64±0.88a |
| Stearic acid | 1975-11-4 | 1876 | ND | ND | ND | ND | ND | 1.34±0.3a |
|  |  |  |  |  |  |  |  |  |
| Toluene | 108-88-3 | 789 | 2.9±1.31a | ND | 1.53±0.11b | ND | ND | ND |
| N,N-dimethyl-Benzenamine | 121-69-7 | 1080 | ND | ND | 0.5±0.08a | ND | ND | ND |
| 1,2,4,5-tetramethyl-Benzene | 95-93-2 | 1107 | 0.81±0.42e | 1.04±0.09a | 0.88±0.41c | 0.98±0.49b | 0.97±0.03b | ND |
| Estragole | 140-67-0 | 1272 | 31.11±4.17a | 11.94±4.04d | 18.91±0.92b | 17.32±1.34c | 8.63±1.62e | 4.89±2e |
| Phenol | 108-95-2 | 1532 | 1.17±0.2c | 0.6±0.27f | 2.58±0.78a | 1.03±0.42d | 0.87±0.08e | 1.67±1.96b |
| Butylated Hydroxytoluene | 128-37-0 | 1446 | 79.54±5.62c | 78.43±6.42d | 95.07±23.65a | 81.06±8.87b | 71.67±3.15e | 62.91±2.82f |
| Ethylbenzene | 100-41-4 | 989 | 0.63±0.2a | ND | ND | ND | 0.44±0.05b | ND |
| 1,3-dimethyl-Benzene | 108-38-3 | 934 | ND | ND | ND | 2.01±0a | 0.67±0.03b | ND |
| 1-ethyl-3-methyl-Benzene | 620-14-4 | 1299 | 1.07±0.18c | ND | ND | 2.52±0.67a | 2.38±0.28b | ND |
| Mesitylene | 108-67-8 | 1016 | ND | ND | ND | 1.24±0.09b | 1.68±0.2a | ND |
| 4-ethyl-1,2-dimethyl-Benzene | 934-80-5 | 1320 | 0.39±0.07e | 1.1±0.62b | ND | 0.72±0.18d | 0.78±0.05c | 6.12±0a |
| 3,5-bis(1,1-dimethylethyl)-Phenol | 1138-52-9 | 1445 | ND | ND | ND | ND | ND | 0.56±0.5a |
| Benzopyridine | 119-65-3 | 1091 | 0.42±0.07ab | ND | 0.43±0.38a | ND | ND | 0.41±0.09b |
| 6-Caprolactam | 105-60-2 | 1484 | 0.58±0.25b | ND | 0.3±0.22c | 0.91±0.18a | ND | ND |
| 1-Dodecen-3-yne | 74744-36-8 | 1260 | ND | ND | 1.03±0.04b | ND | ND | 1.25±0.07a |
| Niacinamide | 98-92-0 | 1876 | ND | ND | 0.19±0.01b | ND | ND | 0.49±0.01a |
| Indole | 120-72-9 | 1743 | 0.4±0.18d | 0.76±0.19b | 0.89±0.29a | 0.68±0.14c | ND | ND |
| 2-pentyl-Furan | 3777-69-3 | 1015 | ND | ND | ND | 1.63±0.74b | 2.05±0.17a | 1.38±0.07c |
| 1-(1H-pyrrol-2-yl)-Ethanone | 1072-83-9 | 1405 | ND | ND | ND | ND | 0.54±0.23a | ND |
| 1-Azanaphthalene | 91-22-5 | 1294 | ND | 0.36±0.06b | ND | 0.49±0.03a | ND | ND |

Note:1 RI, retention index; 2 ND, no detected; different types of letters in the same row indicate significant difference (P<0.05)