

Table S1 Main substances of asphalt VOCs

| Number | Time/min | Substance | Suitability | Peak area |
|--------|----------|---|-------------|-----------|
| 1 | 3.776 | C ₅ H ₁₂ (Pentane) | 91 | 96557055 |
| 2 | 4.535 | C ₃ H ₆ O (Acetone) | 72 | 16961015 |
| 3 | 5.179 | C ₆ H ₁₄ (2-Methylpentane) | 91 | 121377299 |
| 4 | 5.733 | C ₆ H ₁₂ (1-Hexene) | 93 | 154499780 |
| 5 | 5.840 | C ₆ H ₁₄ (Hexane) | 94 | 342175671 |
| 6 | 6.486 | C ₄ H ₈ O (Butanal) | 95 | 67262589 |
| 7 | 6.710 | C ₄ H ₈ O (2-Butanone) | 86 | 31286879 |
| 8 | 7.486 | C ₇ H ₁₆ (3-Methylhexane) | 94 | 65190116 |
| 9 | 7.671 | C ₆ H ₆ (Benzene) | 95 | 22157001 |
| 10 | 7.887 | C ₇ H ₁₄ (1-Heptene) | 97 | 53312432 |
| 11 | 7.993 | C ₇ H ₁₆ (Heptane) | 91 | 187110400 |
| 12 | 8.739 | C ₅ H ₁₀ O (Pentanal) | 86 | 23500469 |
| 13 | 9.368 | C ₈ H ₁₈ (2-Methylheptane) | 97 | 50998377 |
| 14 | 9.585 | C ₂ H ₆ S ₂ (Dimethyl disulfide) | 98 | 7286575 |
| 15 | 9.898 | C ₇ H ₈ (Toluene) | 95 | 23769018 |
| 16 | 11.391 | C ₃ H ₈ S ₂ (Methyl ethyl disulfide) | 94 | 7815323 |
| 17 | 11.886 | C ₈ H ₁₀ (1,3-Dimethylbenzene) | 97 | 14304660 |
| 18 | 12.387 | C ₈ H ₁₀ (O-Xylene) | 95 | 7325838 |
| 19 | 14.106 | C ₉ H ₁₂ (1,3,5-Trimethylbenzene) | 97 | 10787637 |
| 20 | 15.040 | C ₁₀ H ₁₄ (M-Cymene) | 95 | 9376666 |
| 21 | 15.224 | C ₁₁ H ₂₄ (Undecane) | 94 | 83552010 |
| 22 | 15.439 | C ₁₀ H ₁₄ (O-Cymene) | 95 | 17577964 |
| 23 | 15.540 | C ₁₀ H ₁₄ (1-Ethyl-2,3-dimethylbenzene) | 96 | 8484848 |
| 24 | 16.129 | C ₁₀ H ₁₄ (1,2,4,5-Tetramethylbenzene) | 91 | 45555904 |
| 25 | 16.492 | C ₁₀ H ₁₂ (2-Methyl-3-phenyl-1-propene) | 91 | 17483172 |
| 26 | 16.636 | C ₁₂ H ₂₄ (1-Dodecene) | 98 | 45323679 |
| 27 | 16.691 | C ₁₂ H ₂₆ (Dodecane) | 96 | 306384349 |
| 28 | 16.895 | C ₁₃ H ₂₈ (2,6-Dimethylundecane) | 96 | 102752304 |
| 29 | 17.536 | C ₁₀ H ₈ (Naphthalene) | 95 | 365668351 |
| 30 | 18.013 | C ₁₄ H ₂₈ (1-Tetradecene) | 98 | 70566200 |
| 31 | 18.060 | C ₁₃ H ₂₈ (Tridecane) | 97 | 455454268 |
| 32 | 18.207 | C ₁₄ H ₂₈ (E-3-Tetradecene) | 90 | 150607906 |
| 33 | 18.889 | C ₁₄ H ₃₀ (2-Methyltridecane) | 90 | 112366936 |
| 34 | 19.084 | C ₁₁ H ₁₀ (1-Methylnaphthalene) | 94 | 350629632 |
| 35 | 19.393 | C ₁₄ H ₃₀ (n-Tetradecane) | 98 | 711859339 |
| 36 | 20.292 | C ₁₅ H ₃₂ (4-Methyltetradecane) | 92 | 205359155 |
| 37 | 20.369 | C ₁₅ H ₃₂ (2,6,11-Trimethyldodecane) | 90 | 260178985 |
| 38 | 20.446 | C ₁₄ H ₂₈ O (Tetradecanal) | 83 | 44179919 |
| 39 | 20.609 | C ₁₂ H ₁₂ (2-Ethylnaphthalene) | 93 | 91955162 |
| 40 | 20.831 | C ₁₂ H ₁₂ (2,6-Dimethylnaphthalene) | 98 | 265363451 |
| 41 | 21.005 | C ₁₅ H ₃₂ (n-Pentadecane) | 98 | 633418600 |
| 42 | 21.130 | C ₁₂ H ₁₂ (2,3-Dimethylnaphthalene) | 98 | 229617912 |
| 43 | 21.204 | C ₁₂ H ₁₂ (2,7-Dimethylnaphthalene) | 97 | 271912811 |