



Hydrocarbons, $C_2 - C_{10}$

Analysis of car exhaust gases

Application Note

Environmental

Authors

Agilent Technologies, Inc.

Introduction

Gas chromatography with an Agilent CP-Sil 5 CB column separates 81 C_1 to C_7 hydrocarbons in car exhaust gas in 33 minutes.



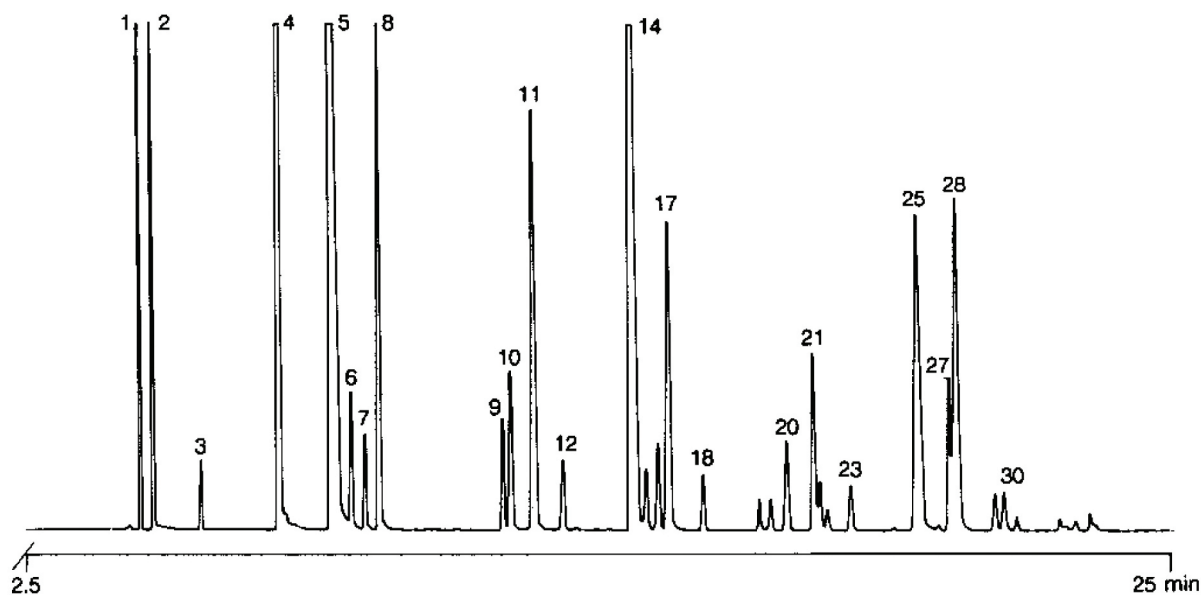
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Conditions

Technique	: GC-capillary
Column 1	: Agilent CP-Sil 5 CB, 0.32 mm x 50 m fused silica WCOT CP-Sil 5 CB (df = 1.2 µm) (Part no. CP7770)
Column 2	: Agilent CP-Al ₂ O ₃ /KCl, 0.53 mm x 25 m fused silica PLOT CP-Al ₂ O ₃ /KCl (df = 10 µm) (Part no. CP7517)
Temperature	: 50 °C (5 min) → 200 °C, 5 °C/min
Carrier Gas	: He, 120 kPa (1.2 bar, 17 psi)
Injector	: Auto-TCT
Detector	: FID, T = 300 °C
Sample Size	: 60 mL concentrated on adsorbent tube
Configuration	: First fraction (C ₁ - C ₅): column 1 → column 2 → FID; second fraction C ₆₊ : column 1 → FID
Courtesy	: Dr. Rädlein, Mercedes-Benz AG, Stuttgart - Untertürkheim, Germany

C₁ - C₅ fraction on column 1 + column 2

Peak identification	Retention time (min):
1. ethane	4.76
2. ethylene	4.96
3. propane	5.92
4. propylene	7.42
5. acetylene	8.44
6. isobutane	8.85
7. propadiene	9.13
8. n-butane	9.40
9. trans-2-butene	11.89
10. 1-butene	12.04
11. isobutene	12.48
12. cis-2-butene	13.07
14. methylbutane	14.43
17. n-pentane	15.16
18. 1,3-butadiene	15.90
20. trans-2-pentene	17.51
21. 2-methyl-2-butene	18.04
23. cis-2-pentene	18.76
25. 2,2-dimethylbutane	20.01
27. 2,3-dimethylbutane	20.69
28. 2-methylpentane	20.80
30. 2-methyl-1,3-butadiene	21.77

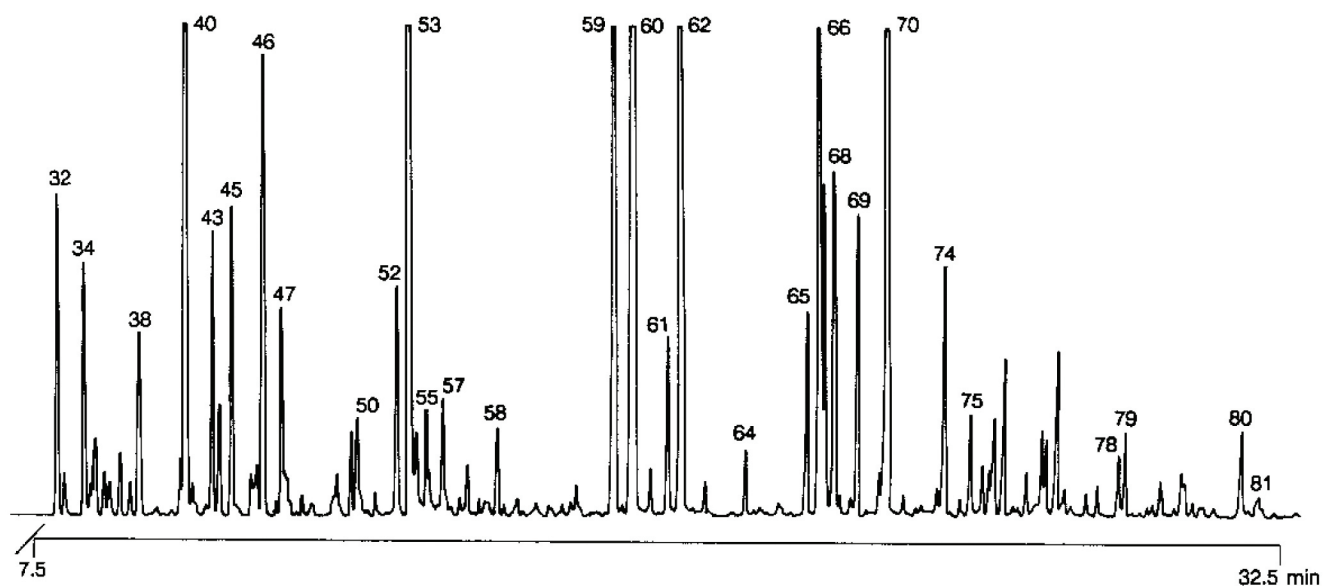


***C₆₊* fraction on column 1**

Peak identification

Retention time (min):

32. 3-methylpentane	7.82	59. ethyl benzene	19.16
34. n-hexane	8.34	60. m-, p-xylene	19.51
38. methylcyclopentane		61. styrene	20.28
+ 2,4-dimethylpentane	9.44	62. o-xylene	20.52
40. benzene	10.39	64. isopropylbenzene	21.85
43. 2-methylhexane	10.98	65. n-propylbenzene	23.07
45. 3-methylhexane	11.36	66. 1-ethyl-3-methylbenzene	23.34
46. 2,2,4-trimethylpentane	2.01	68. 1,3,5-trimethylbenzene	23.64
47. n-heptane	12.38	69. 1-ethyl-2-methylbenzene	24.11
50. 2,4-dimethylhexane	13.95	70. 1,2,4-trimethylbenzene	24.70
52. 2,3,4-trimethylpentane	14.76	74. 1,2,3-trimethylbenzene	25.86
53. toluene +		75. indan	26.40
2,3,3-trimethylpentane	15.02	78. 1,2,4,5-tetramethylbenzene	29.45
55. 2-methylheptane	15.36	79. 1,2,3,5-tetramethylbenzene	29.58
57. 3-methyl heptane	15.71	80. naphthalene	31.96
58. n-octane	16.82	81. n-dodecane	32.32



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This information is subject to change without notice.

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