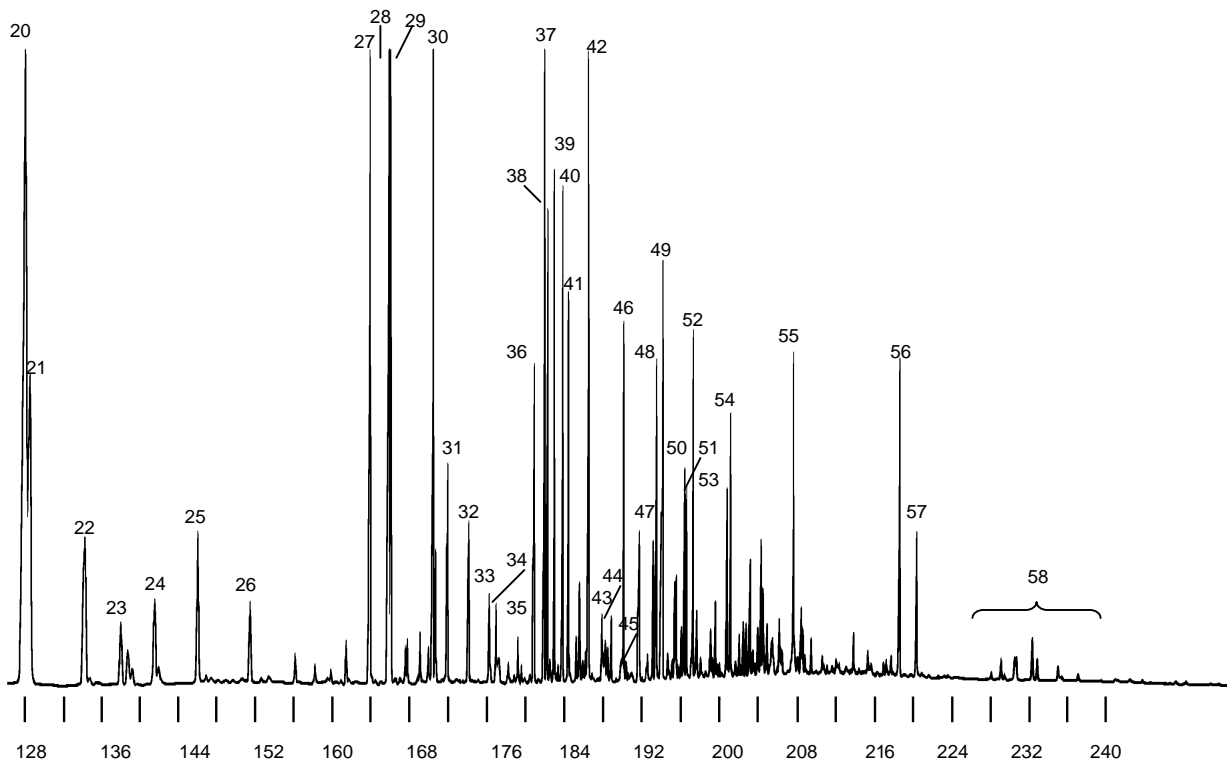
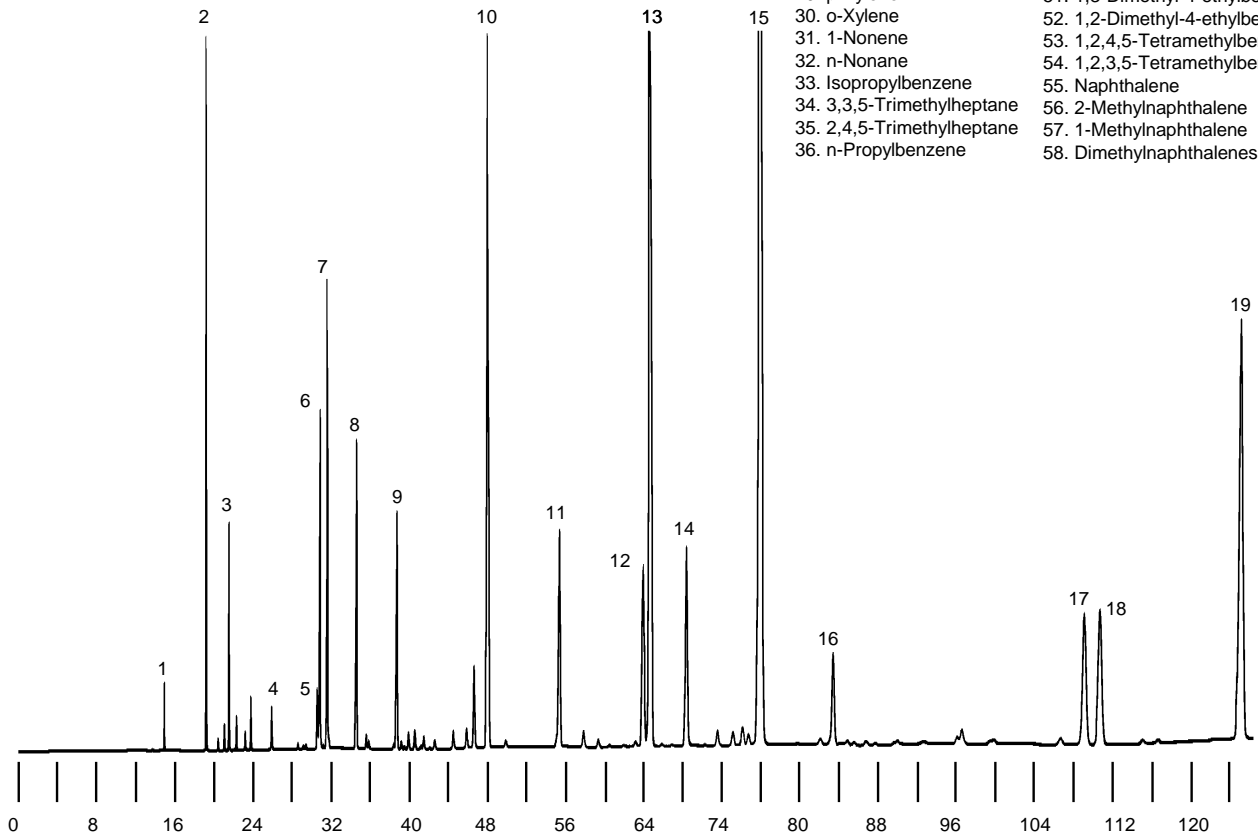


# 燃料 - ガソリンの成分の詳細分析

Column : Petrocol DH 150, 150m x 0.25mm ID, 1.0µm film  
 Cat. No. : 24155  
 Oven : 35 (125 min.) to 200 at 2 /min  
 Carrier : Helium, 20 cm/sec  
 Det. : FID  
 Inj. : 0.1 µL unleaded gasoline, split(100:1)

- |                         |                            |                                 |
|-------------------------|----------------------------|---------------------------------|
| 1. n-Butane             | 15. 2,2,4-Trimethylpentane | 37. 1-Methyl-3-ethylbenzene     |
| 2. Isopentane           | 16. n-Heptane              | 38. 1-Methyl-4-ethylbenzene     |
| 3. n-Pentane            | 17. 2,5-Dimethylhexane     | 39. 1,3,5-Trimethylbenzene      |
| 4. 2,2-Dimethylbutane   | 18. 2,4-Dimethylhexane     | 40. 3,3,4-Trimethylheptane      |
| 5. Cyclopentane         | 19. 2,3,4-Trimethylpentane | 41. 1-Methyl-2-ethylbenzene     |
| 6. 2,3-Dimethylbutane   | 20. Toluene                | 42. 1,2,4-Trimethylbenzene      |
| 7. 2-Methylpentane      | 21. 2,3,3-Trimethylpentane | 43. Isobutylbenzene             |
| 8. 3-Methylpentane      | 22. 2,3-Dimethylhexane     | 44. sec-Butylbenzene            |
| 9. n-Hexane             | 23. 2-Methylheptane        | 45. n-Decane                    |
| 10. 2,4-Dimethylpentane | 24. 3-Methylheptane        | 46. 1,2,3-Trimethylbenzene      |
| 11. Benzene             | 25. 2-Methyl-1-heptene     | 47. Indane                      |
| 12. 2-Methylhexane      | 26. n-Octane               | 48. 1,3-Diethylbenzene          |
| 13. 2,3-Dimethylpentane | 27. Ethylbenzene           | 49. n-Butylbenzene              |
| 14. 3-Methylhexane      | 28. m-Xylene               | 50. 1,4-Dimethyl-2-ethylbenzene |
|                         | 29. p-Xylene               | 51. 1,3-Dimethyl-4-ethylbenzene |
|                         | 30. o-Xylene               | 52. 1,2-Dimethyl-4-ethylbenzene |
|                         | 31. 1-Nonene               | 53. 1,2,4,5-Tetramethylbenzene  |
|                         | 32. n-Nonane               | 54. 1,2,3,5-Tetramethylbenzene  |
|                         | 33. Isopropylbenzene       | 55. Naphthalene                 |
|                         | 34. 3,3,5-Trimethylheptane | 56. 2-Methylnaphthalene         |
|                         | 35. 2,4,5-Trimethylheptane | 57. 1-Methylnaphthalene         |
|                         | 36. n-Propylbenzene        | 58. Dimethylnaphthalenes        |



# 燃料 - ガソリンの成分の詳細分析

Column : Petrocol DH,100m x 0.25mm ID,0.5um film

Cat. No. : 24160

Oven: 35 (15min) to 200 /min,hold 5min

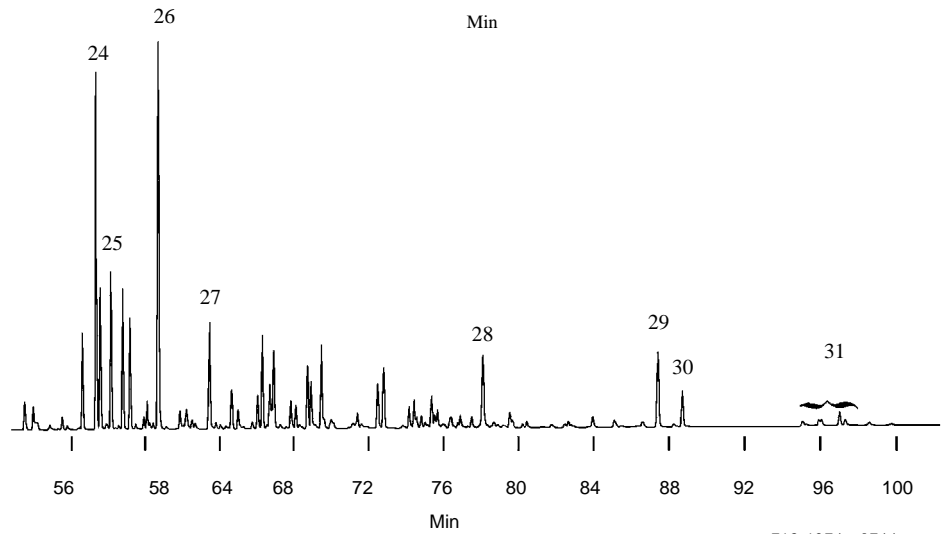
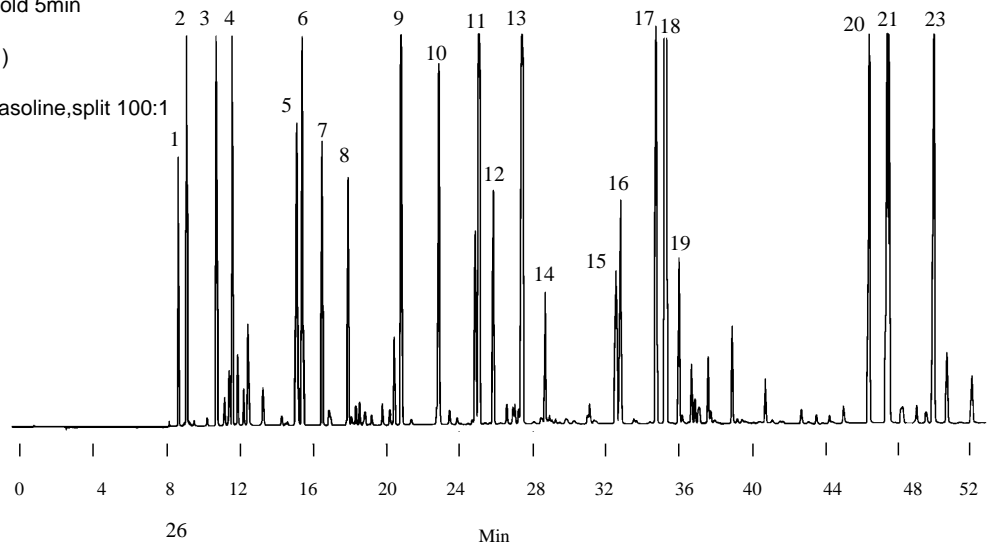
Inj.: 250

Carrier gas: helium,20cm/sec(set at 35 )

Det.: FID (250 )

Injection : 0.1 uL, premium unleaded gasoline,split 100:1

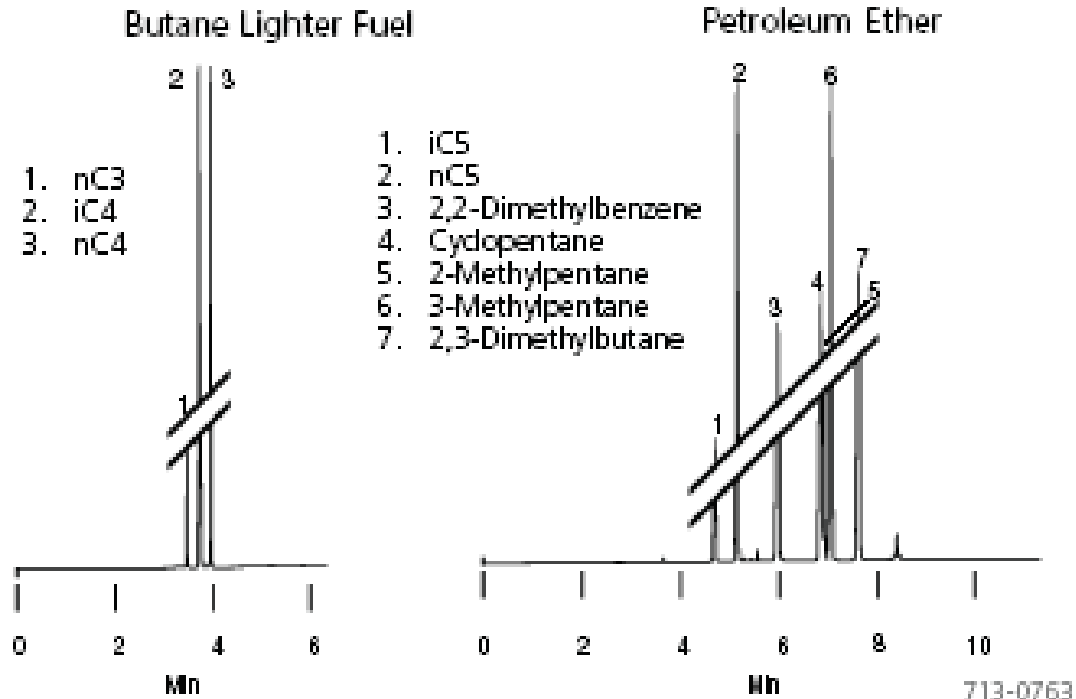
1. Isoutane
2. N-Butane
3. Isopentane
4. n-Pentane
5. 2,3-Dimethylbutane
6. 2-Methylpentane
7. 3-Methylpentane
8. n-Hexane
9. 2,4-Dimethylpentane
10. Benzene
11. 2-Methylhexane
12. 3-Methylhexane
13. 2,2,4-Trimethylpentane
14. n-heptane
15. 2,5-Dimethylhexane
16. 2,4-Dimethylhexane
17. 2,3,4-Trimethylpne
18. Toluene
19. 2,3- Dimethylhexane
20. Ethylbenzene
21. m-Xylene
22. P-Xylene
23. O-Xylene
24. 1-Methyl-3-ethylbenzene
25. 1,3,5-Trimethylbenzene
26. 1,2,4-Trimethylbenzene
27. 1,2,3-Trimethylbenzene
28. Naphthalene
29. 2-Methylnaphthalene
30. 1-Methylnaphthalene
31. Dimethylnaphthalenes



713-1274, 0744

## Figure 1. Simple Hydrocarbon Mixtures

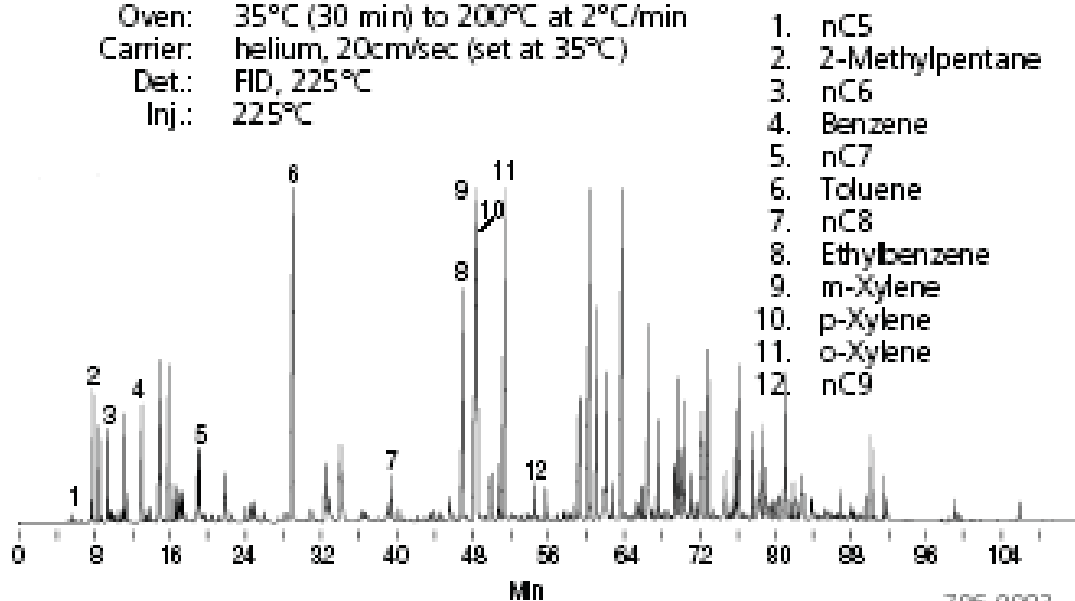
Column: Petrocol DH 50.2, 50m x 0.20mm ID, 0.5µm film  
 Cat. No.: 24133-U  
 Oven: 35°C (30 min) to 200°C at 2°C/min  
 Carrier: helium, 20cm/sec (set at 35°C)  
 Det.: FID, 225°C  
 Inj.: 225°C



713-0763

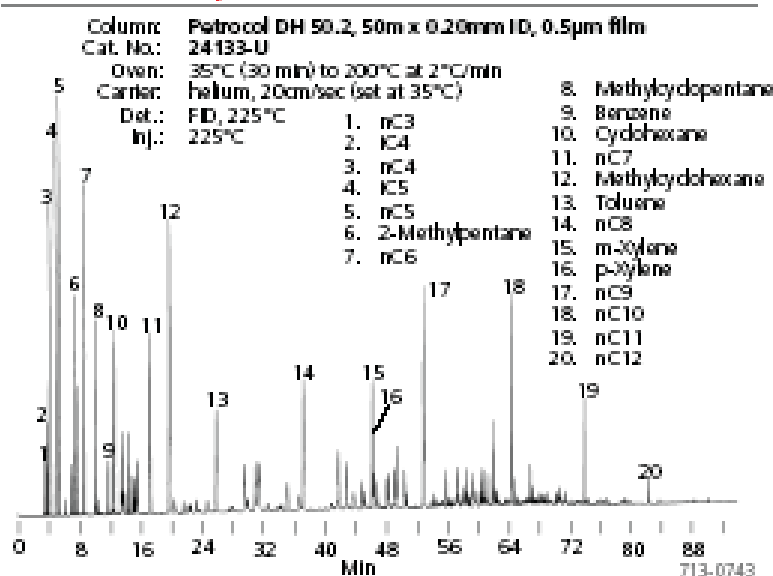
## Figure 2. Unleaded Gasoline

Column: Petrocol DH 50.2, 50m x 0.20mm ID, 0.5µm film  
 Cat. No.: 24133-U  
 Oven: 35°C (30 min) to 200°C at 2°C/min  
 Carrier: helium, 20cm/sec (set at 35°C)  
 Det.: FID, 225°C  
 Inj.: 225°C

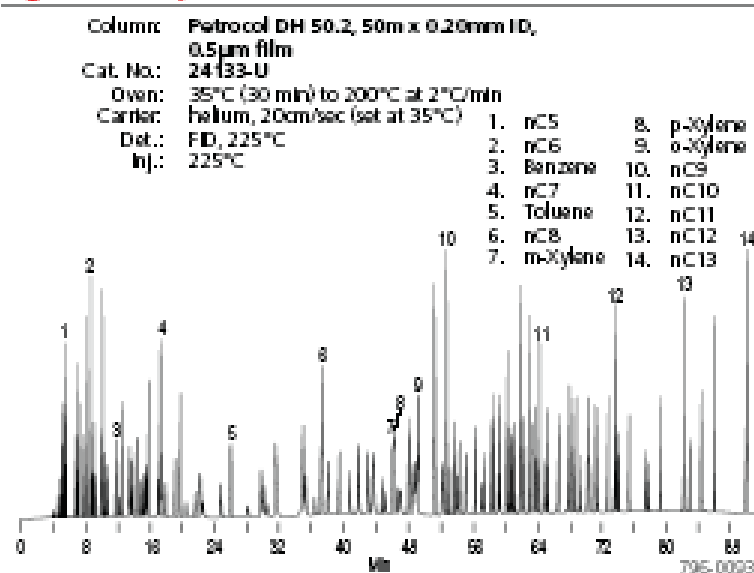


796-0092

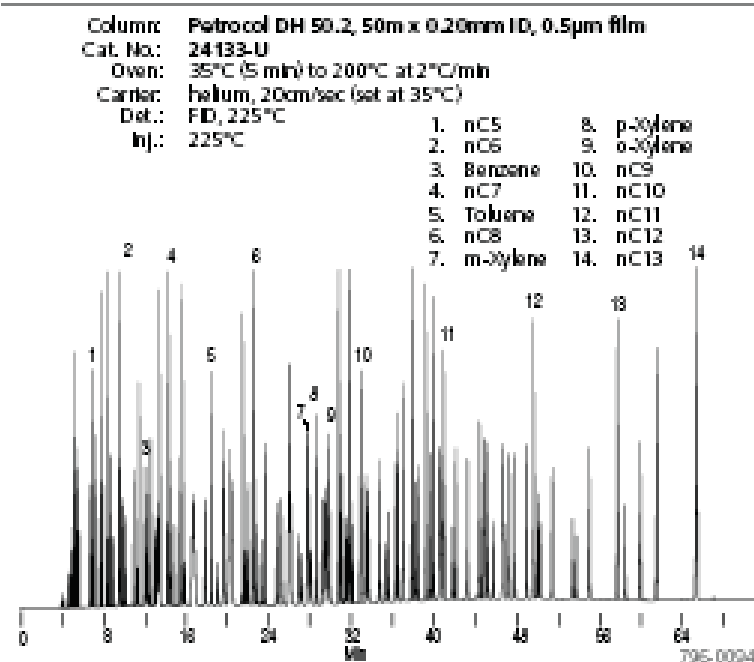
**Figure 3. Detailed Analysis of Qualitative Reference & Naphtha**



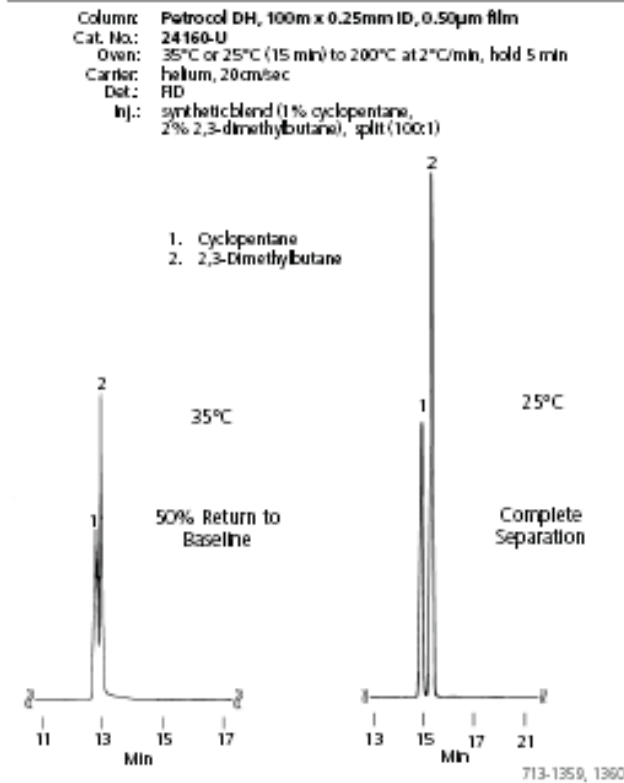
**Figure 4. Quantitative PIANO Standard**



**Figure 5. Quantitative PIANO Standard, Using Rapid Temperature Program**



**Figure 6. 2,3-Dimethylbutane from Cyclopentane**

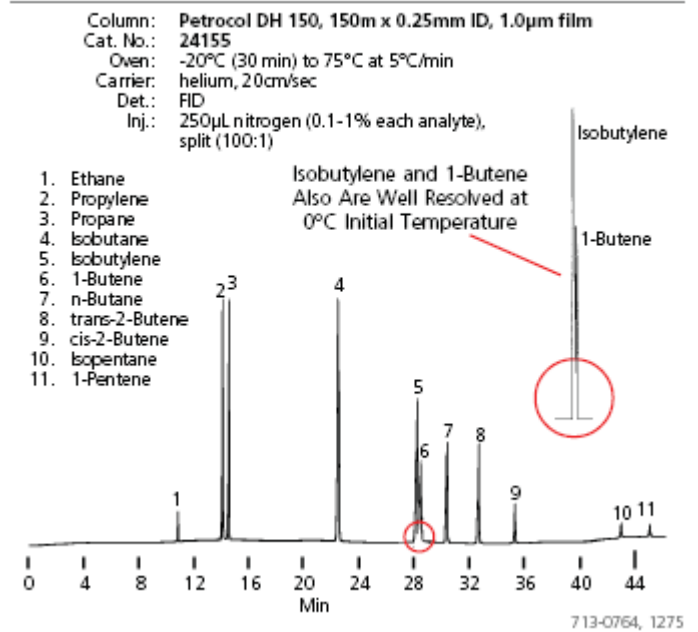


\*PCNA: paraffins-olefins-naphthenes-aromatics

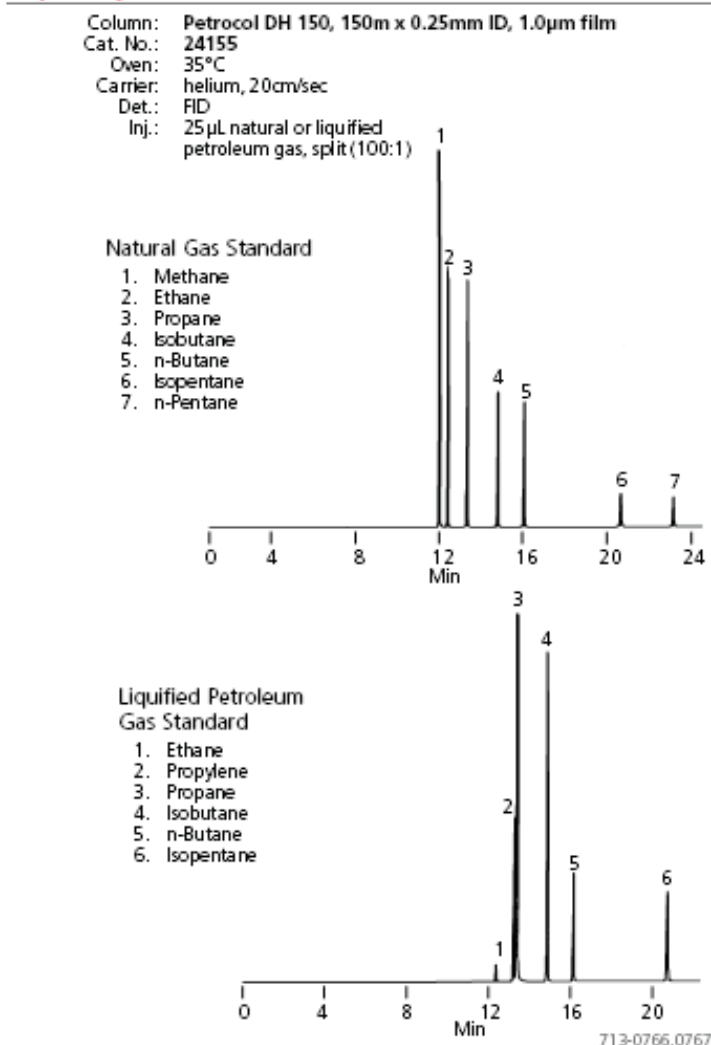
PNA: paraffins-naphthenes-aromatics

PANCO: paraffins-to paraffins-aromatics-naphthenes-olefins

**Figure 9. Light Hydrocarbons, Using Moderately Subambient Initial Temperature**



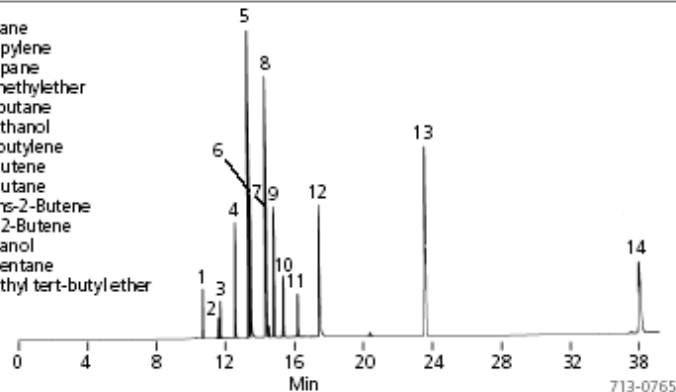
**Figure 10. Gaseous Hydrocarbons from Liquid Hydrocarbons**



**Figure 11. Oxygenated Compounds in a C4 Gas Stream, Using Ambient, Isothermal Temperature**

Column: Petrocol DH 150, 150m x 0.25mm ID, 1.0µm film  
 Cat. No.: 24155  
 Oven: 25°C  
 Carrier: helium, 20cm/sec  
 Det.: FID  
 Inj.: 50µL nitrogen (0.1-2% each analyte), split(100:1)

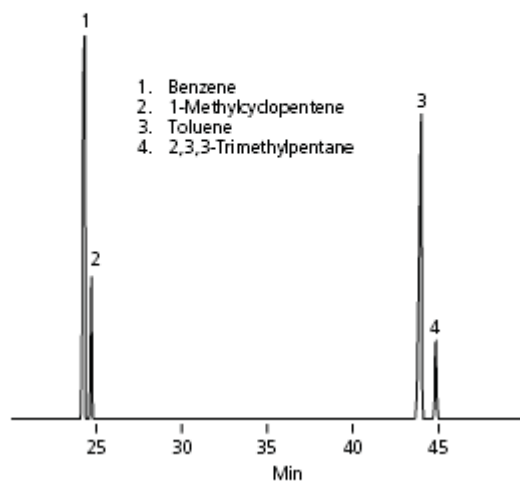
1. Ethane
2. Propylene
3. Propane
4. Dimethylether
5. Isobutane
6. Methanol
7. Isobutylene
8. 1-Butene
9. n-Butane
10. trans-2-Butene
11. cis-2-Butene
12. Ethanol
13. n-Pentane
14. Methyl tert-butylether



713-0765

**Figure 13. Key Hydrocarbon Pairs Completely Resolved**

Column: Petrocol DH Octyl, 100m x 0.25mm ID, 0.5µm film  
 Cat. No.: 24282  
 Oven: 110°C to 220°C at 8°C/min  
 Carrier: helium, 24cm/sec  
 Det.: FID, 250°C  
 Inj.: 0.1µL, split 215:1, 250°C

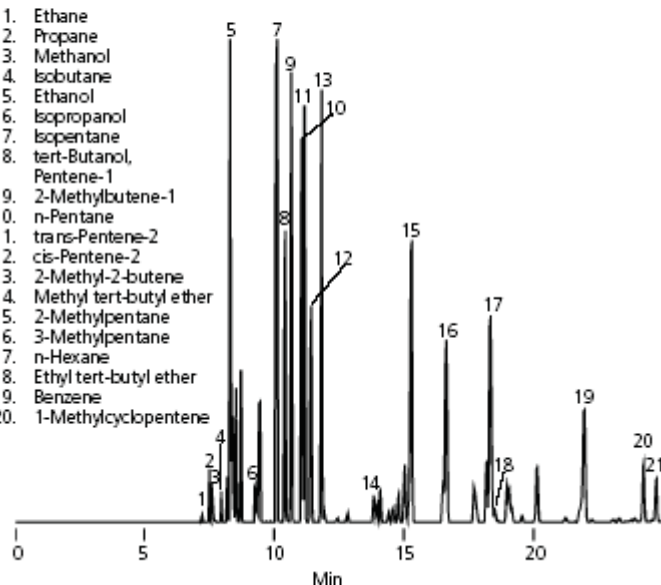


94-0364

**Figure 14. PONA V Mix**

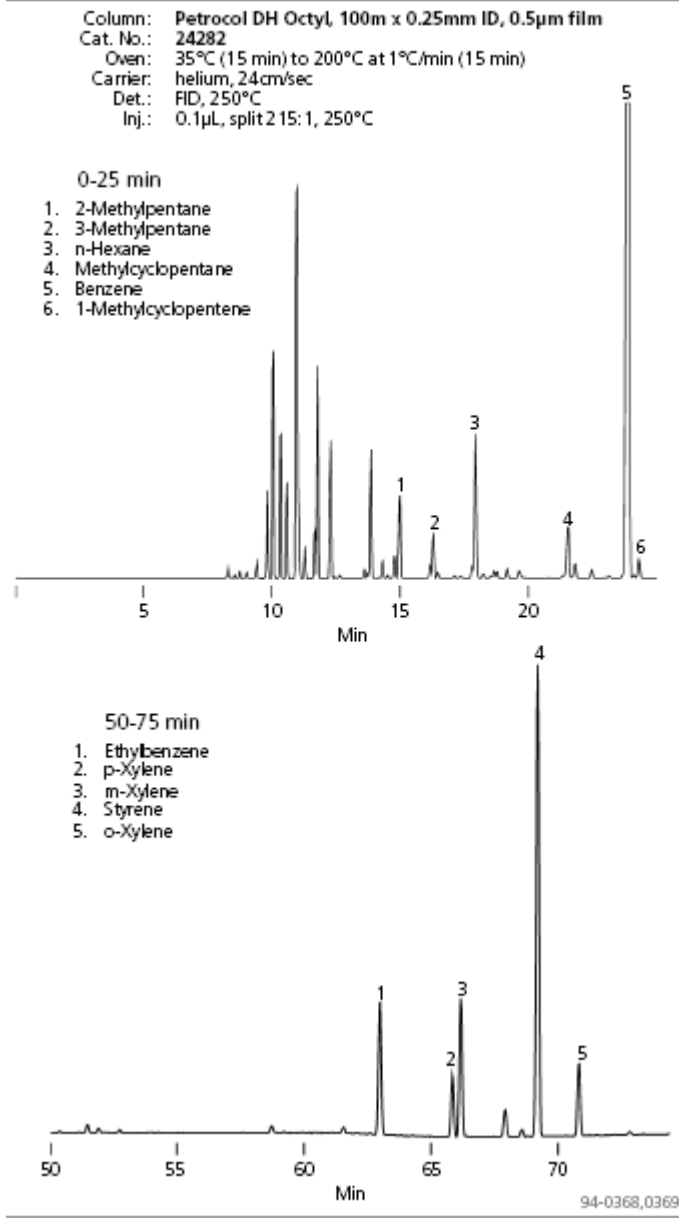
Column: Petrocol DH Octyl, 100m x 0.25mm ID, 0.5µm film  
 Cat. No.: 24282  
 Oven: 35°C (15 min) to 200°C at 1°C/min (15 min)  
 Carrier: helium, 24cm/sec  
 Det.: FID, 250°C  
 Inj.: 0.1µL, split 215:1, 250°C

1. Ethane
2. Propane
3. Methanol
4. Isobutane
5. Ethanol
6. Isopropanol
7. Isopentane
8. tert-Butanol, Pentene-1
9. 2-Methylbutene-1
10. n-Pentane
11. trans-Pentene-2
12. cis-Pentene-2
13. 2-Methyl-2-butene
14. Methyl tert-butyl ether
15. 2-Methylpentane
16. 3-Methylpentane
17. n-Hexane
18. Ethyl tert-butyl ether
19. Benzene
20. 1-Methylcyclopentene

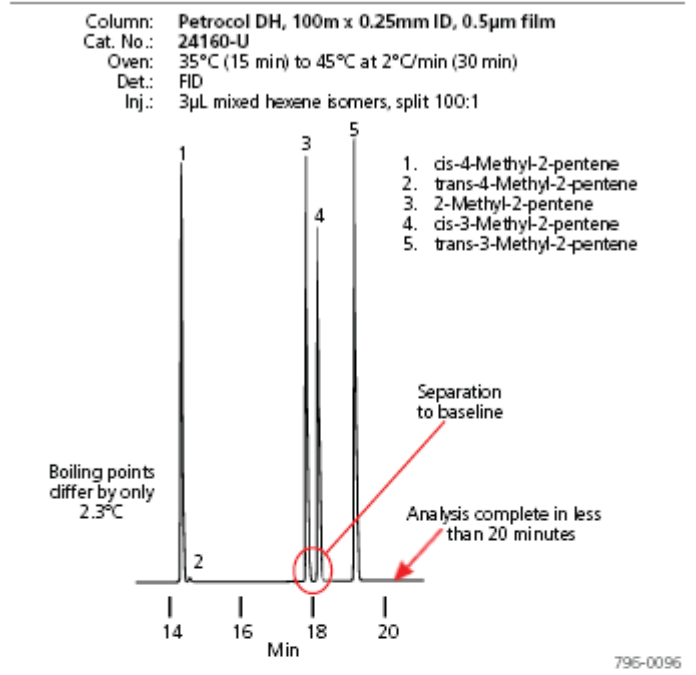


94-0366

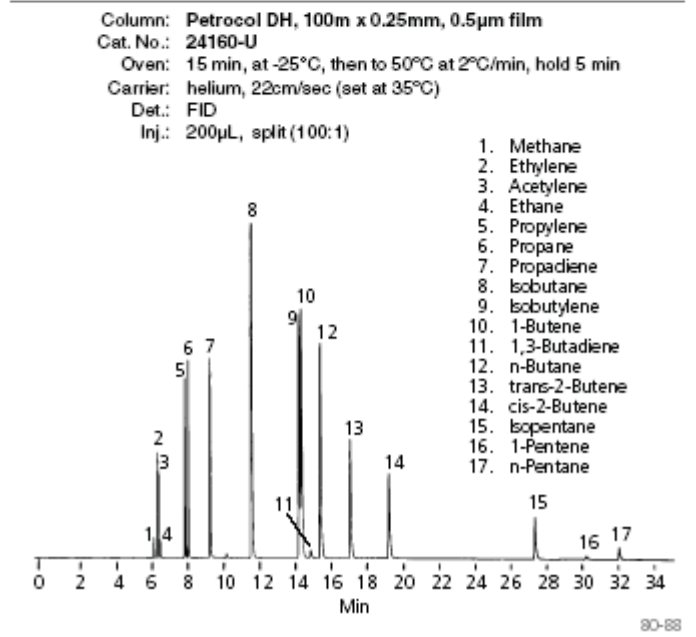
**Figure 15. Pyrolysis Gasoline (Py Gas)**



**Figure 18. Closely Eluting Hexene Isomerization Products**



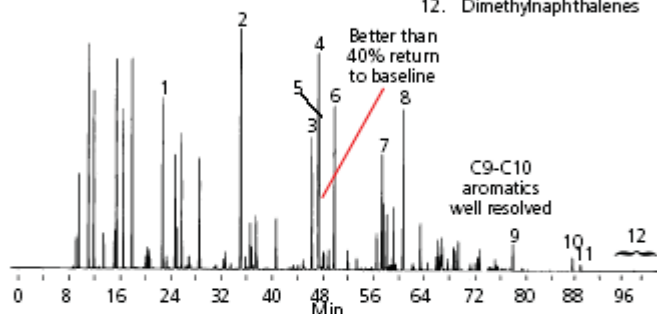
**Figure 19. Light Hydrocarbon Gases, Using a Subambient Initial Temperature**



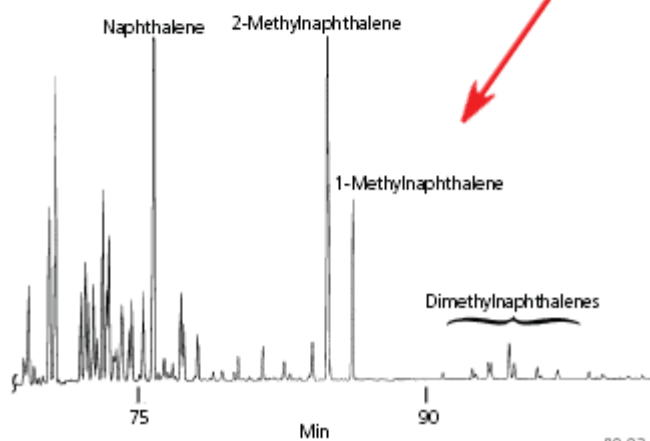
**Figure 20. Petroleum Reformate**

Column: Petrocol DH, 100m x 0.25mm ID, 0.5µm film  
 Cat. No.: 24160-U  
 Oven: 35°C (15 min) to 200°C at 2°C/min (30 min)  
 Det.: FID  
 Inj.: 0.1µL reformate, split 100:1

1. Benzene
2. Toluene
3. Ethylbenzene
4. m-Xylene
5. p-Xylene
6. o-Xylene
7. 1-Methyl-3-ethylbenzene
8. 1,2,4-Trimethylbenzene
9. Naphthalene
10. 2-Methylnaphthalene
11. 1-Methylnaphthalene
12. Dimethylnaphthalenes



Higher Resolution of Polynuclear Aromatic Hydrocarbons

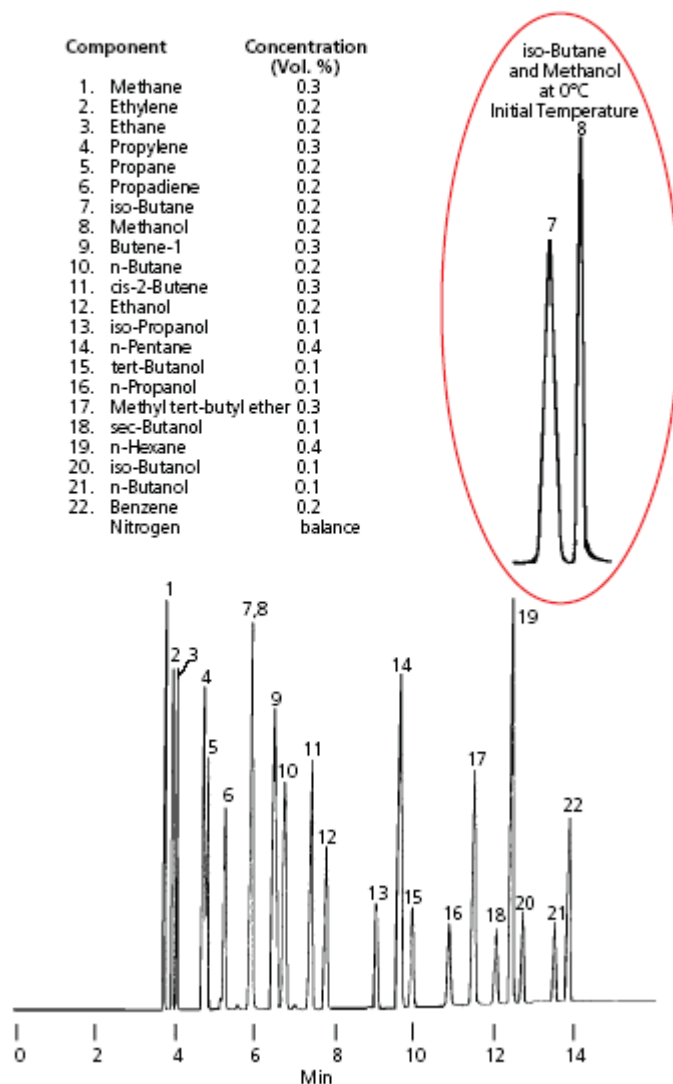


80-93

**Figure 21. C1-C6 Hydrocarbons and C1-C4 Alcohols on a Thick Film Capillary Column**

Column: SPB-1, 60m x 0.53mm ID, 5µm film  
 Cat. No.: 25349  
 Oven: 30°C (5 min) to 200°C at 20°C/min  
 (inset: initial temp. 0°C)  
 Carrier: helium, 19-21cm/sec  
 Det.: FID, 220°C  
 Inj.: 250µL (balance N<sub>2</sub>), split 100:1, 200°C

Component	Concentration (Vol. %)
1. Methane	0.3
2. Ethylene	0.2
3. Ethane	0.2
4. Propylene	0.3
5. Propane	0.2
6. Propadiene	0.2
7. iso-Butane	0.2
8. Methanol	0.2
9. Butene-1	0.3
10. n-Butane	0.2
11. cis-2-Butene	0.3
12. Ethanol	0.2
13. iso-Propanol	0.1
14. n-Pentane	0.4
15. tert-Butanol	0.1
16. n-Propanol	0.1
17. Methyl tert-butyl ether	0.3
18. sec-Butanol	0.1
19. n-Hexane	0.4
20. iso-Butanol	0.1
21. n-Butanol	0.1
22. Benzene	0.2
Nitrogen	balance

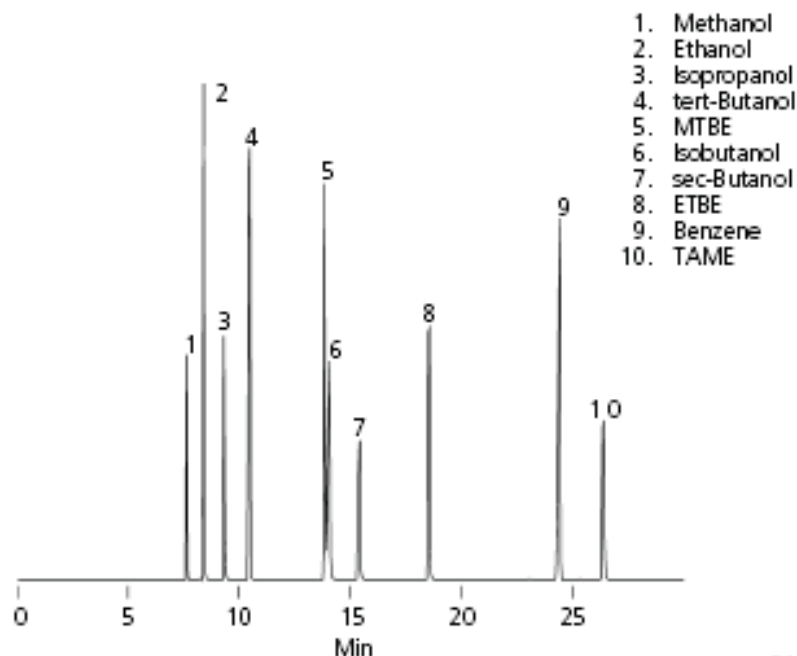


796-0097,0098



## Figure 26. Oxygenates Mix (Petrocol DH Octyl Column)

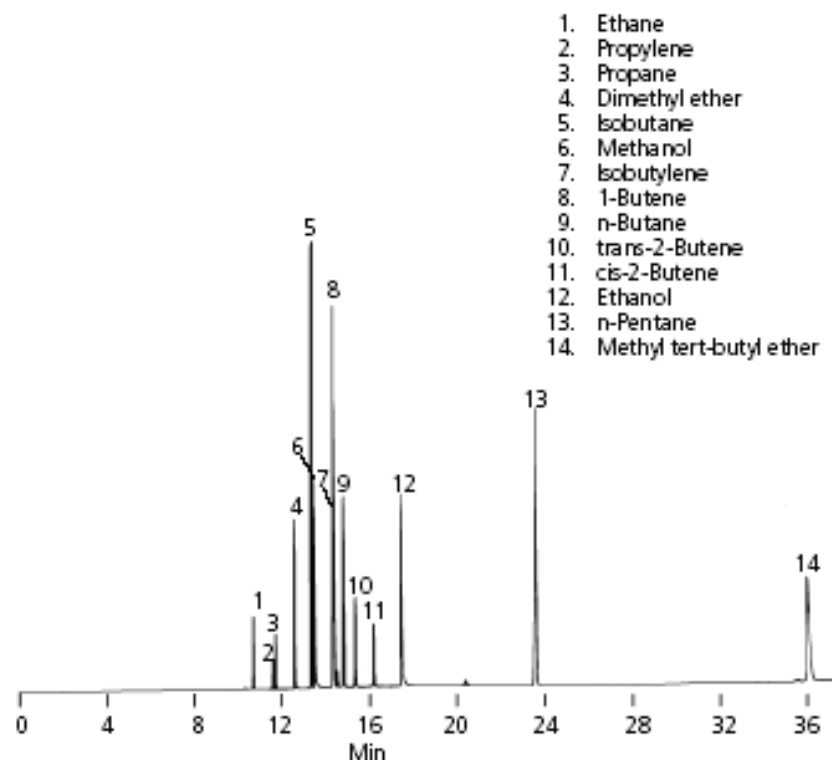
Column: Petrocol DH Octyl, 100m x 0.25mm ID, 0.5µm film  
Cat. No.: 24282  
Oven: 35°C (15 min) to 200°C at 1°C/min (15 min)  
Carrier: helium, 24cm/sec  
Det.: FID, 250°C  
Inj.: 0.1µL, split 215:1, 250°C



94-0372

## Figure 28. Oxygenates (Petrocol DH 150 Column)

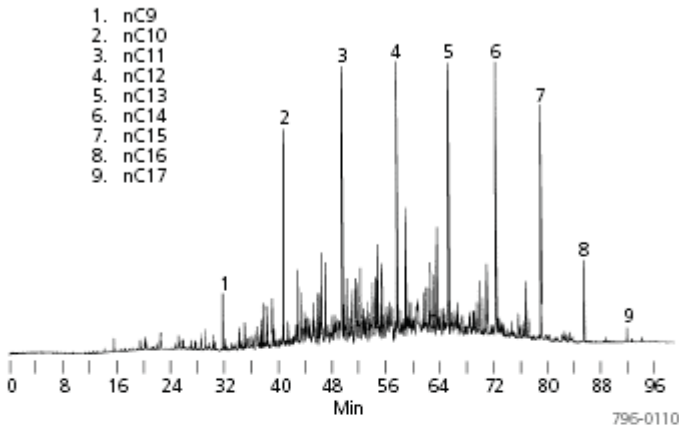
Column: Petrocol DH 150, 150m x 0.25mm ID, 1.0µm film  
Cat. No.: 24155  
Oven: 25°C  
Carrier: helium, 20cm/sec (set at 35°C)  
Det.: FID, 200°C  
Inj.: approx. 0.1-2% each component in 50µL nitrogen,  
split 100:1, 200°C



713-0765

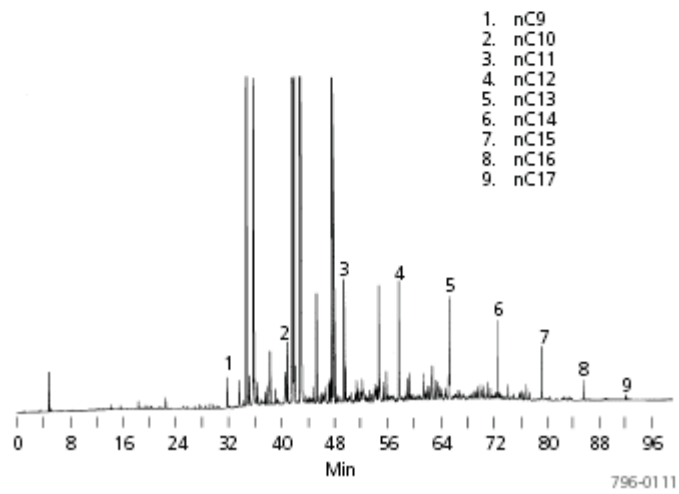
**Figure 45. Charcoal Lighter Fluid**

Column: Petrocol DH 50.2, 50m x 0.20mm ID, 0.50µm film  
Cat. No.: 24133-U  
Oven: 35°C (5 min) to 200°C at 2°C/min  
Carrier: helium, 19-21cm/sec  
Det.: FID



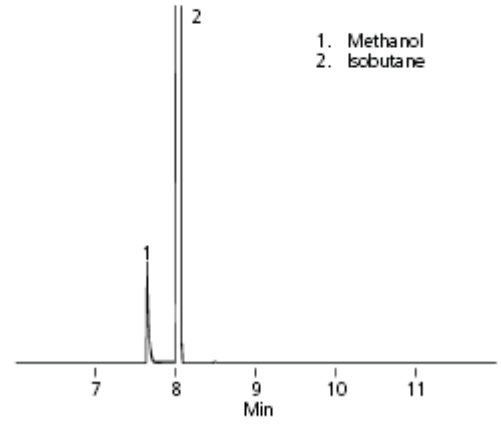
**Figure 46. Turpentine**

Column: Petrocol DH 50.2, 50m x 0.20mm ID, 0.50µm film  
Cat. No.: 24133-U  
Oven: 35°C (5 min) to 200°C at 2°C/min  
Carrier: helium, 19-21cm/sec  
Det.: FID



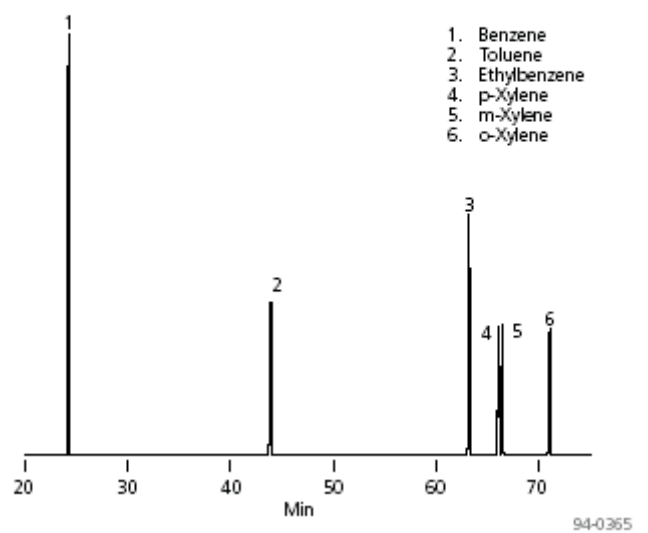
**Figure 51. Methanol and Isobutane**

Column: Petrocol DH Octyl, 100m x 0.25mm ID, 0.5µm film  
Cat. No.: 24282  
Oven: 35°C  
Carrier: helium, 24cm/sec  
Det.: FID, 250°C  
Inj.: 0.1µL, split 2 15: 1, 250°C



**Figure 68. BTEX Compounds**

Column: Petrocol DH Octyl, 100m x 0.25mm ID, 0.5µm film  
Cat. No.: 24282  
Oven: 35°C (15 min) to 200°C at 1°C/min (15 min)  
Carrier: helium, 24cm/sec  
Det.: FID, 250°C  
Inj.: 0.1µL, split 2 15: 1, 250°C



## MTBE 不純物の詳細分析

Column : Petrocol DH Octyl 100 m x 0.25 mm ID, 0.5 µm film

Cat. No. : 24282

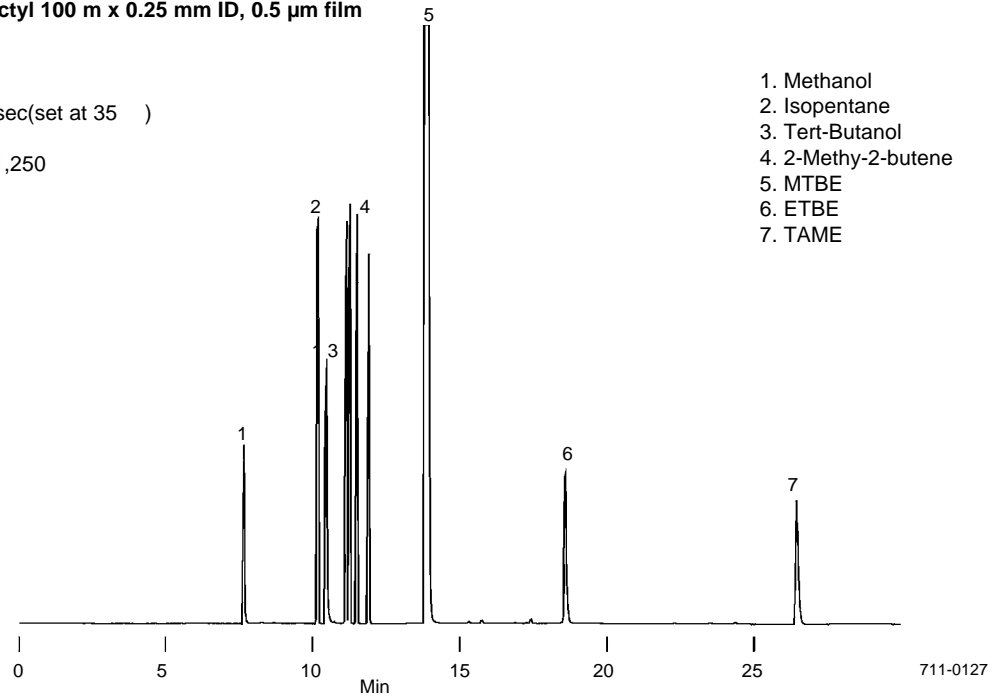
Oven : 35 (15 min.)

Inj.:

Carrier : Helium, 24 cm/sec(set at 35 )

Det. : FID,250

Inj. : 0.1µL,split215:1,250



1. Methanol
2. Isopentane
3. Tert-Butanol
4. 2-Methy-2-butene
5. MTBE
6. ETBE
7. TAME

## MTBE 不純物の詳細分析

Column : Petrocol DH,100m x 0.25mm ID,0.50um film

Cat. No. : 24160-U

Oven: 50 (13min) to 180 at 10 /min

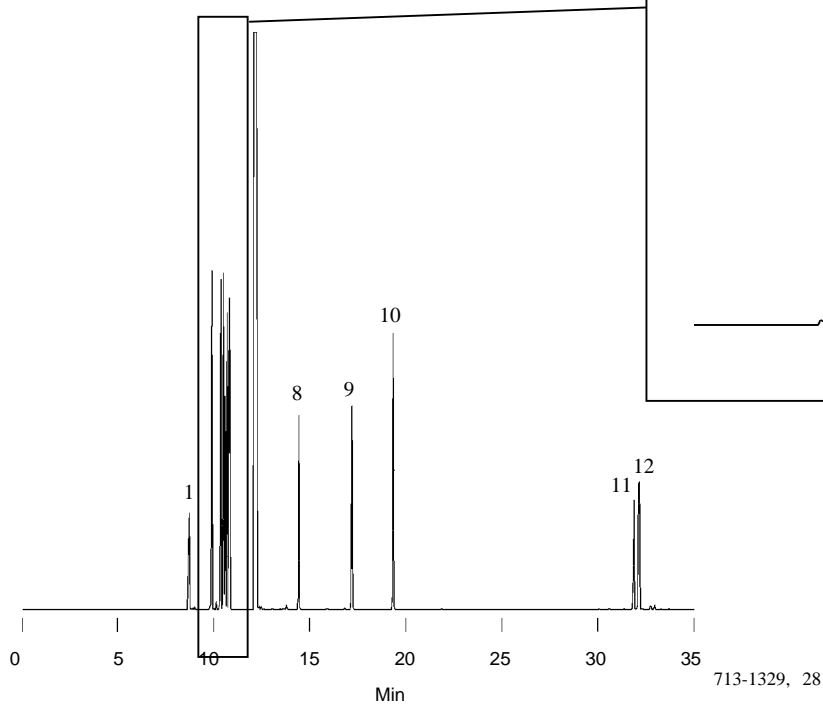
Inj.: 200

Carrier gas: helium,20cm/sec;vent flow 140mL/min(set at 35 )

Det : FID, 310

Injection : 1 ul,MTBE containing 1% each analyte

(MTBE Contaminants Mix A, Cat. No. 47942, split (200:1))



1. Methanol
2. Isopentane
3. n-Pentane
4. trans-2-Pentene
5. tert-Butanol
6. cis-2-Pentane
7. 2-Methyl-2-butene
8. tert-Buthyl ethyl ether
9. tert-Amyl methyl ether(TAME)
10. 2,4,4-Trimethyl-1-pentene  
Triisobutylene Isoers:
11. 4,4-Dimethyl-2-neopentyl-1-pentene
12. 2,2,4,6,6-Pentamethyl-3-heptene

\*Purity and weight % differ slightly from lot to lot, and will be listed on the data sheet included with the product

# 燃料 - ナフサ

Column : Petrocol DH,100m x 0.25mm ID,0.5um film

Cat. No. : 24160

Oven: 35 (15min) to 200 /min,hold 5min

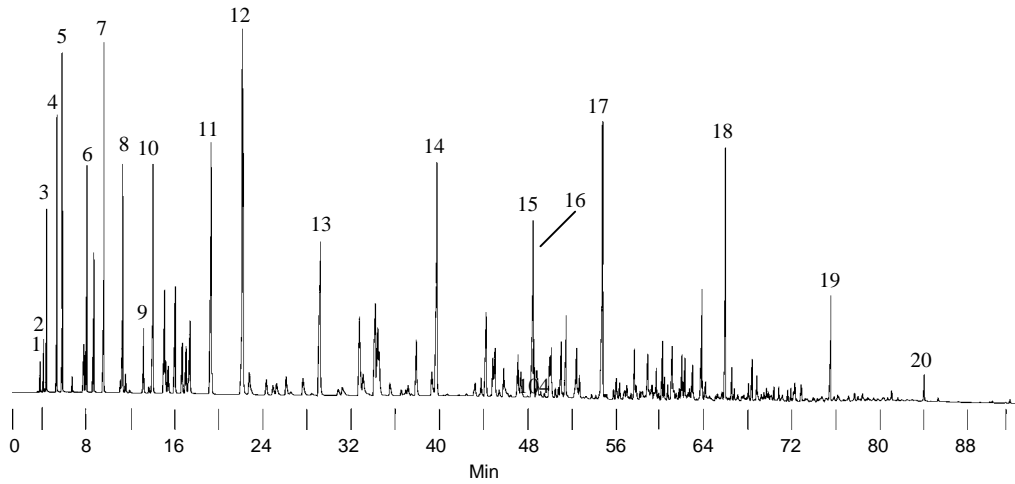
Inj.:250

Carrier gas: helium,20cm/sec(set at 35 )

Det. : FID (250 )

Injection : 0.1 uL, premium unleaded gasoline,split 100:1

- |                       |                       |
|-----------------------|-----------------------|
| 1. nC3                | 11. nC7               |
| 2. iC4                | 12. Methylcyclohexane |
| 3. nC4                | 13. Toluene           |
| 4. iC5                | 14. nC8               |
| 5. 2,3-Dimethylbutane | 15. m-Xylene          |
| 6. 2-Methylpentane    | 16. P-Xylene          |
| 7. nC6                | 17. nC9               |
| 8. Methylcyclopentane | 18. nC10              |
| 9. Benzene            | 19. nC11              |
| 10. cyclohexane       | 20. nC12              |



713-0743

# リファレンスガスオイル

Column : Petrocol 2887, 5m x 0.53mm ID, 0.5um film

Cat. No. : 25323

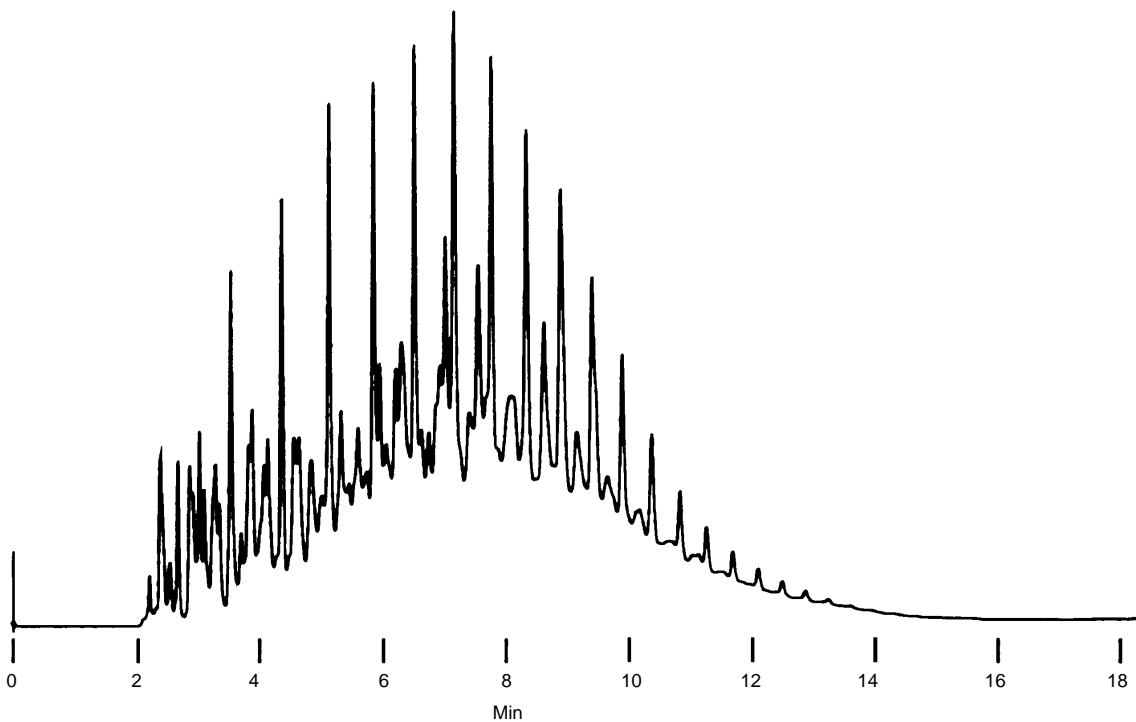
Inj.: 350

Oven: -20 to 320 at 20 /min, hold 5 /min

Carrier gas: nitrogen,6mL/min

Det. : FID, 350

Inj. : 0.1 uL Reference Gas oil (Cat.no 4-8873),direct injection



713-0774

## Figure 38. D2887 SIMDIS Calibration Blend

Column: **Petrocol 2887, 5m x 0.53mm ID, 0.5µm film**  
Cat. No.: **25323**  
Col. Temp.: -20°C to 320°C at 20°C/min, hold 5 min  
Carrier: nitrogen, 6mL/min  
Det.: FID  
Inj.: 0.1µL Quantitative Calibration Mix (Cat. No. 48882), direct

