

PAH Priority Analysis



LC|GC



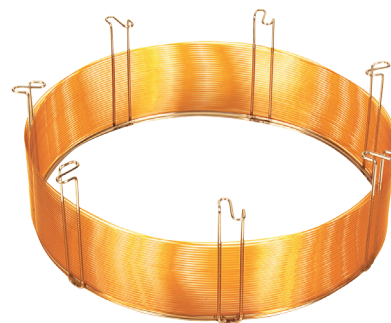
Kinetex PAH

- Expanded resolution with chemical selectivity specifically for PAHs
- Increased throughput and sensitivity with core-shell technology for HPLC/UHPLC



Zebron PAH

- Accurately quantitate EU and EPA PAHs in less than 28 minutes
- Excellent separation for critical PAH isomers



FASTER, BETTER RESULTS

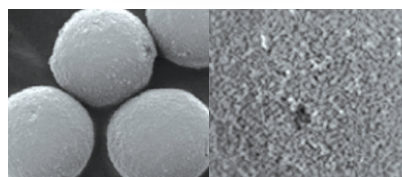
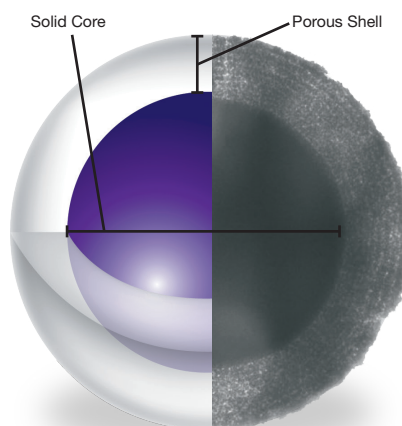
Kinetex Core-Shell Technology

The Chosen Core-Shell Brand

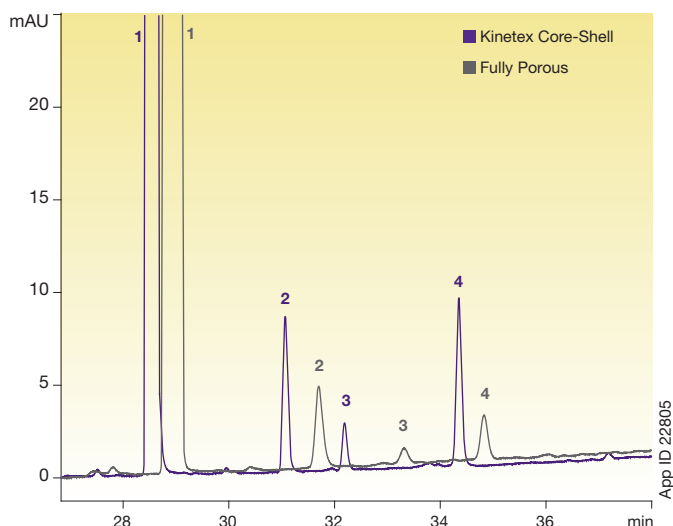
Kinetex® Core-Shell Technology delivers dramatic improvements in efficiency over conventional fully porous media which can be leveraged to increase resolution, greatly improve productivity, reduce solvent consumption, and decrease costs. Whether you are running HPLC or UHPLC methods, the Kinetex core-shell family can deliver shockingly improved performance over the current column you are using.

Finely Tuned, Unique Core-Shell Manufacturing Process

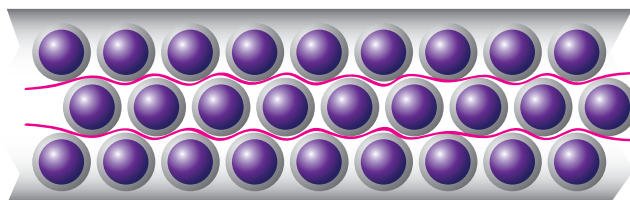
Phenomenex designs, manufactures, and sells its very own silica and organo-silica core-shell particles. Using silica sol-gel processing techniques that incorporate nano-structuring technology, a durable, homogeneous porous shell is grown on a solid silica core to create a core-shell particle. The combination of a consistent, solid high density core along with proprietary column packing technologies ensures optimum bed structure and high column performance.



Typical Core-Shell Performance Gains!



You can unleash the power of Kinetex Core-Shell Technology columns to achieve faster and better results just not possible on conventional fully porous materials. No matter what type of system you have or type of analysis you are performing, there is a Kinetex solution for you.

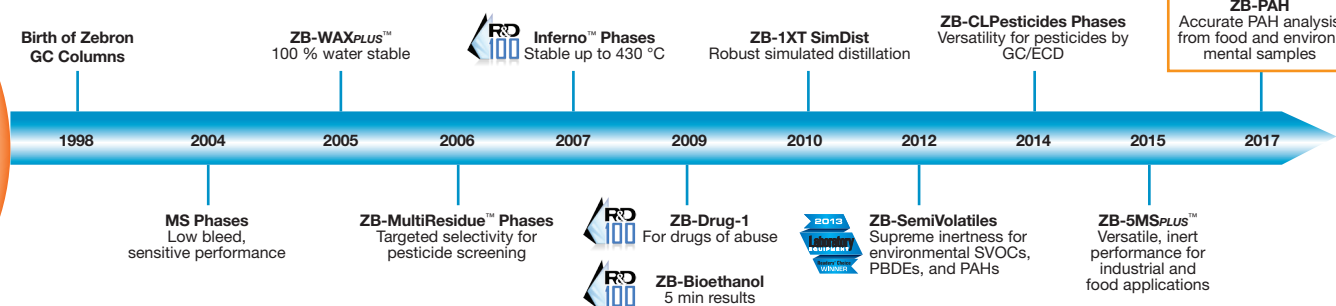


RESULTS DRIVEN BY:

Zebron™ Gas Chromatography Technology

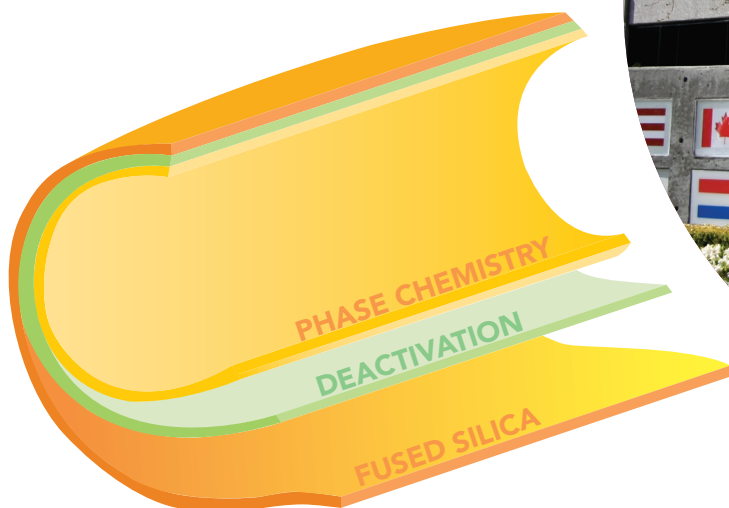
Continued Innovation with GC Expertise

Our inventive GC scientists have 25+ years of experience, and many helped create keystone phases at J&W Scientific before joining the Phenomenex team. Zebron's track record of innovation is the only to be recognized with 3 R&D 100 Awards and 2 Readers' Choice awards! This tradition of GC innovation continues even into 2017 with the release of the ZB-23, ZB-88, ZB-FAME and ZB-PAH.



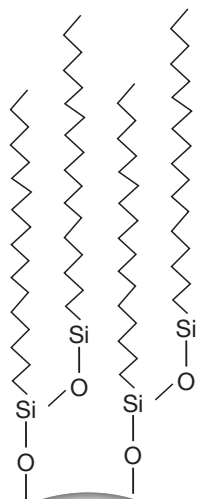
More Than Just A Column

When you choose Zebron, you get more than just high quality GC products. Choosing Zebron means you get access to a wide variety of tools, resources, and personalized support to help make your GC work easier, faster, and simply better.



Designed for **PAH Analysis** by HPLC/UHPLC

“**Innovative Polymerically Bonded C18 Core-Shell PAH Column!**”



Polycyclic aromatic hydrocarbons (PAHs) are a hazardous set of compounds that come from a variety of materials and processes. With the need to accurately identify toxic forms of these compounds quickly in the environmental, fuel, food industries, we specifically developed the first core-shell based LC product for PAH analysis. Now high resolution PAH separations can be attained under fast run times on both HPLC or UHPLC instrumentation.



Controlled pore size processing and a proprietary polymerically bonded stationary phase were developed to ensure excellent resolution between priority polycyclic aromatic hydrocarbons (PAHs). Combined with core-shell particle technology, incredibly high efficiency and sensitivity at comfortable LC pressures is very achievable.

- **QC tested for PAHs (EPA 610)**
- **Enhanced resolution and performance for PAH analysis**

Have either an HPLC or UHPLC?

No worries! The Kinetex® PAH 3.5µm core-shell particle size and format has been chosen to provide optimal performance on both HPLC and UHPLC instrumentation.

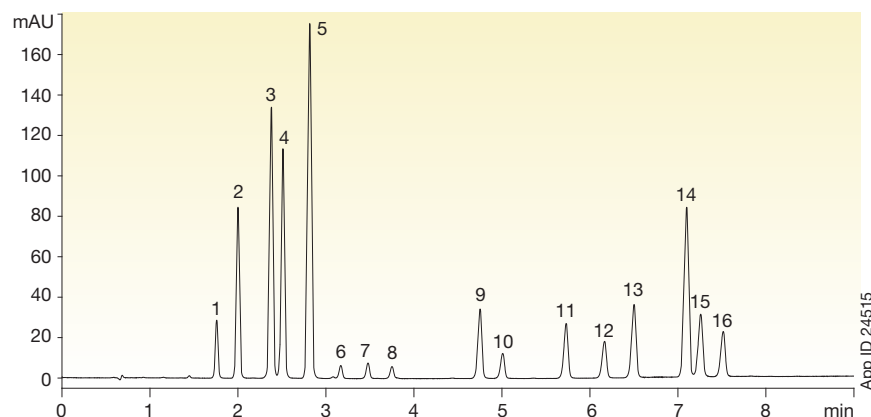
Learn More Online

Find more methods and applications online at www.phenomenex.com/PAH



LC Application Examples

EPA 610 – PAH Analysis



Column: Kinetex 3.5 μ m PAH
Dimensions: 100 x 4.6 mm
Part No.: 00D-4764-E0
Mobile Phase: A: Water
 B: Acetonitrile
Gradient:

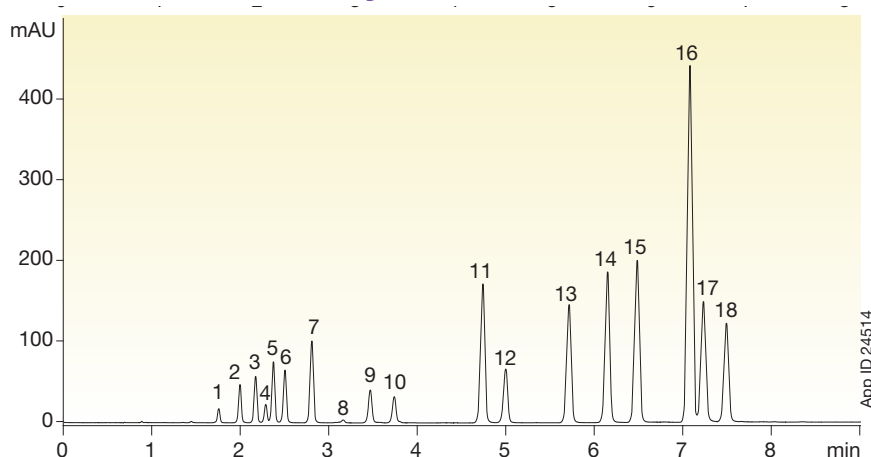
Time (min)	% B
0	50
7	100
8	100
9	50
12	50

Flow Rate: 1.2 mL/min
Backpressure: 136 Bar
Temperature: 35 °C

Detection: UV @ 292 nm
Sample:

- | | |
|-------------------|----------------------------|
| 1. Naphthalene | 9. Benzo[a]anthracene |
| 2. Acenaphthylene | 10. Chrysene |
| 3. Acenaphthene | 11. Benzo[b]fluoranthene |
| 4. Fluorene | 12. Benzo[k]fluoranthene |
| 5. Phenanthrene | 13. Benzo[a]pyrene |
| 6. Anthracene | 14. Dibenzo[a,h]anthracene |
| 7. Fluoranthene | 15. Benzo[ghi]perylene |
| 8. Pyrene | 16. Indeno[1,2,3-cd]pyrene |

EPA 8310 – PAH Analysis



Column: Kinetex 3.5 μ m PAH
Dimensions: 100 x 4.6 mm
Part No.: 00D-4764-E0
Mobile Phase: A: Water
 B: Acetonitrile
Gradient:

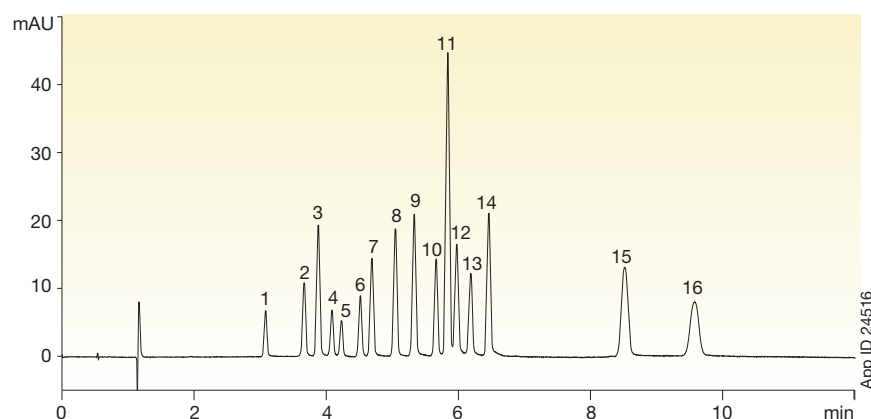
Time (min)	% B
0	50
7	100
8	100
9	50
12	50

Flow Rate: 1.2 mL/min
Backpressure: 136 Bar
Temperature: 35 °C

Detection: UV @ 292 nm
Sample:

- | | |
|------------------------|----------------------------|
| 1. Naphthalene | 10. Pyrene |
| 2. Acenaphthylene | 11. Benzo[a]anthracene |
| 3. 1-Methylnaphthalene | 12. Chrysene |
| 4. 2-Methylnaphthalene | 13. Benzo[b]fluoranthene |
| 5. Acenaphthene | 14. Benzo[k]fluoranthene |
| 6. Fluorene | 15. Benzo[a]pyrene |
| 7. Phenanthrene | 16. Dibenzo[a,h]anthracene |
| 8. Anthracene | 17. Benzo[ghi]perylene |
| 9. Fluoranthene | 18. Indeno[1,2,3-cd]pyrene |

EU 15+1 PAH Analysis



Column: Kinetex 3.5 μ m PAH
Dimensions: 100 x 4.6 mm
Part No.: 00D-4764-E0
Mobile Phase: A: Water
 B: Acetonitrile
Gradient:

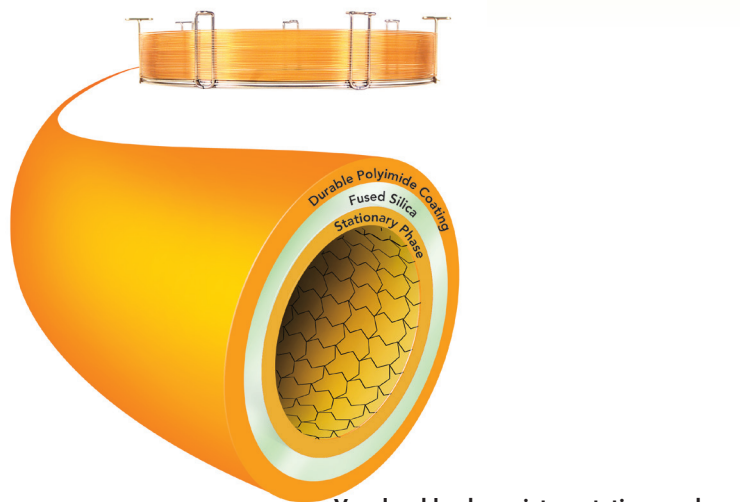
Time (min)	% B
0	50
6	100
11.5	100
12	50
14	50

Flow Rate: 1.5 mL/min
Backpressure: 136 Bar
Temperature: 35 °C

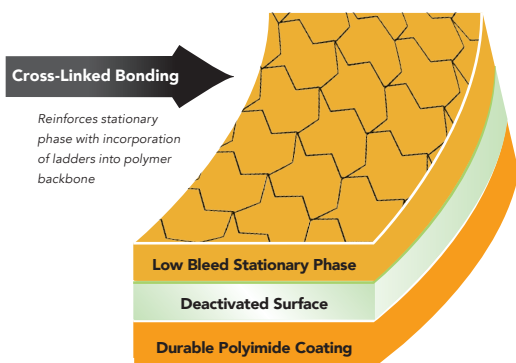
Detection: UV @ 292 nm
Sample:

- | | |
|-------------------------|----------------------------|
| 1. Benzo[c]fluorene | 9. Benzo[a]pyrene |
| 2. Cyclopenta[cd]pyrene | 10. Dibenzo[a,l]pyrene |
| 3. Benzo[a]anthracene | 11. Dibenzo[a,h]anthracene |
| 4. Chrysene | 12. Benzo[ghi]perylene |
| 5. 5-Methylchrysene | 13. Indeno[1,2,3-cd]pyrene |
| 6. Benzo[j]fluoranthene | 14. Dibenzo[a,e]pyrene |
| 7. Benzo[b]fluoranthene | 15. Dibenzo[a,i]pyrene |
| 8. Benzo[k]fluoranthene | 16. Dibenzo[a,h]pyrene |

Designed for **PAH Analysis** by GC



Very low bleed proprietary stationary phase is applied to the deactivated surface



Zebtron™ ZB-PAH columns are manufactured and tested to provide the most optimal performance for EU-regulated polycyclic aromatic hydrocarbons (PAHs). The columns are individually tested with an application-specific QC test probe mixture and deliver excellent resolution of critical PAH isomers, such as benzo[b,j,k]fluoranthene.

With exceptional thermal stability and low column bleed at elevated temperatures, ZB-PAH columns bring the added benefit of good column lifetime alongside a consistent column inertness that promotes accurate baseline resolution for critical isomer pairs.

Fit for Purpose Testing

ZB-PAH columns are verified with tight industry QC specifications for column bleed, sensitivity, and performance to provide you utmost confidence in qualitative and quantitative results for the analysis of PAHs.

- QC tested for PAHs
- Exceptional thermal stability and low column bleed

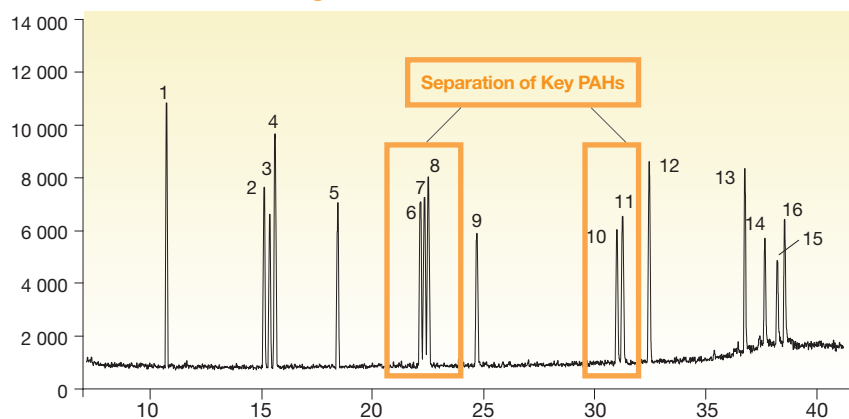


Easy Liner Selection

Our GC liner finder tool makes liner selection a breeze. You can even search by application, injection type, GC system, or your current liner part number. <https://www.phenomenex.com/FindLiner>

EPA and EU GC Application Examples

EU 15+1 PAH Analysis

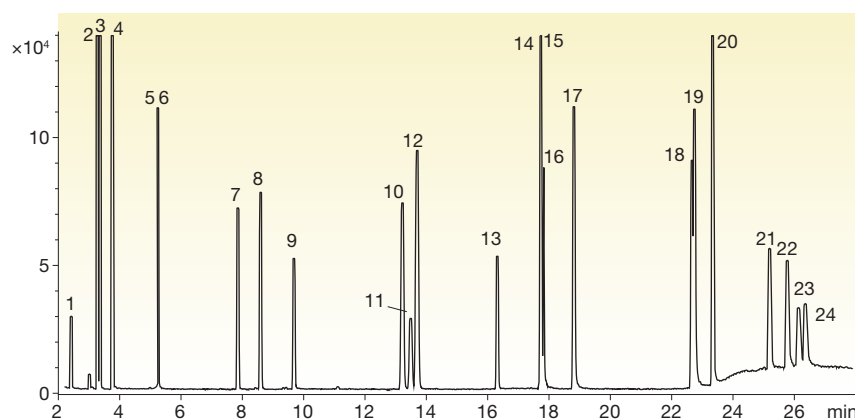


Column: Zebron ZB-PAH
Dimension: 20 meter x 0.18 mm x 0.14 μ m
Part No.: 7FD-G038-47
Injection: Splitless @ 325 °C, 0.5 μ L
Carrier Gas: Helium @ 1 mL/min (constant flow)
Oven Program: 45 °C for 0.8 min to 200 °C @ 45 °C/min to 225 °C @ 2.5 °C/min to 266 °C @ 3 °C/min to 300 °C @ 5 °C/min to 320 °C @ 10 °C/min for 4.5 min
Detector: MS @ 300 °C; 50-550 amu
Sample:

1. Benzo[c]fluorene	9. Benz[a]pyrene
2. Benz[a]anthracene	10. Indeno[1,2,3-cd]pyrene
3. Cyclopenta[c,d]pyrene	11. Dibenzo[a,h]anthracene
4. Chrysene	12. Benzo[g,h,i]perylene
5. 5-Methylchrysene	13. Dibenzo[a,l]pyrene
6. Benzo[b]fluoranthene	14. Dibenzo[a,e]pyrene
7. Dibenzo[k]fluoranthene	15. Dibenzo[a,i]pyrene
8. Benzo[j]fluoranthene	16. Dibenzo[a,h]pyrene

App ID 24510

Expanded EU 15+1 and EPA 610 PAH Analysis

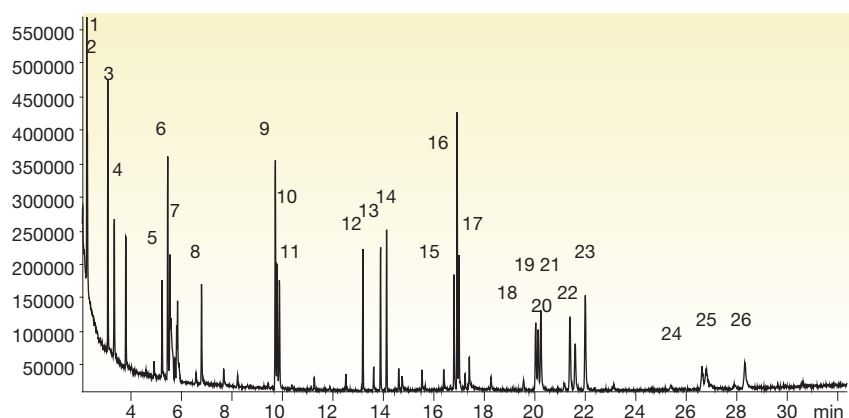


Column: Zebron ZB-PAH
Dimension: 20 meter x 0.18 mm x 0.14 μ m
Part No.: 7FD-G038-47
Injection: Splitless @ 300 °C, 0.5 μ L
Carrier Gas: Helium @ 1.8 mL/min (constant flow)
Oven Program: 70°C for 0.8 min to 180°C @ 70°C/min to 230°C @ 7°C/min for 6 min to 280°C @ 40°C/min for 5 min to 335°C @ 25°C/min for 5.0 min
Detector: MS @ 340 °C; 50-400 amu
Sample:

1. Naphthalene	13. N5-Methylchrysene
2. Acenaphthylene	14. Benzo[b]fluoranthene
3. Acenaphthene	15. Benzo[k]fluoranthene
4. Fluorene	16. Benzo[j]fluoranthene
5. Phenanthrene	17. Benzo[a]pyrene
6. Anthracene	18. Indeno[1,2,3-cd]pyrene
7. Fluoranthene	19. Dibenzo[a,h]anthracene
8. Pyrene	20. Benzo[g,h,i]perylene
9. Benzo[c]fluorene	21. Dibenzo[a,l]pyrene
10. Benzo[a]anthracene	22. Dibenzo[a,e]pyrene
11. Cyclopenta[c,d]pyrene	23. Dibenzo[a,i]pyrene
12. Chrysene	24. Dibenzo[a,h]pyrene

App ID 24492

GC-MS Analysis of PAHs in Rubber and Plastic



Column: Zebron ZB-PAH
Dimension: 20 meter x 0.18 mm x 0.14 μ m
Part No.: 7FD-G038-47
Injection: Splitless @ 290 °C, 1 μ L
Carrier Gas: Helium @ 52 cm/sec (constant flow)
Oven Program: 120°C for 1.0 min to 200°C @ 8°C/min for 0.5 min to 270°C @ 11°C/min to 300°C @ 2°C/min
Detector: MS @ 340 °C; 50-450 amu
Sample:

1. Naphthalene-d8	14. p-Terphenyl-d14
2. Naphthalene	15. Benzo[a]anthracene
3. 2-methylnaphthalene	16. Chrysene-d12
4. 1-methylnaphthalene	17. Chrysene
5. Acenaphthylene	18. Benzo[b]fluoranthene
6. Acenaphthylene-d10	19. Benzo[k]fluoranthene
7. Acenaphthene	20. Benzo[j]fluoranthene
8. Fluorene	21. Benzo[e]pyrene
9. Phenanthrene-d10	22. Benzo[a]pyrene
10. Phenanthrene	23. Perylene-d12
11. Anthracene	24. Indeno[1,2,3-cd]pyrene
12. Fluoranthene	25. Dibenzo[a,h]anthracene
13. Pyrene	26. Benzo[g,h,i]perylene

App ID 24508

Easily improve your **sensitivity** and **recovery** before analysis!

With the widest range of sample preparation solutions from Phenomenex you can clean up any matrix before testing for PAHs!

roQ

Type: QuEChERS (Quick, Easy, Cheap, Effective, Rugged, and Safe)

Description: Quick and efficient process to extract multi-residue target analytes from food samples while removing unwanted interferences such as organic acids, lipids, pigments, sugars, and more. Each kit contain centrifuge tubes, pre-weighed salts in convenient single-use packets, and pre-weighed and packed SPE centrifuge tubes.

roQ
QuEChERS Kits



Strata Silica SPE

Type: Solid Phase Extraction

Description: Reversed phase, normal phase, or ion-exchange based media that allows for direct retention and elution of compounds of interest, with wash steps to remove unwanted interferences. Available in tubes (ranging from 1 mL to 60 mL) and 96-well plate formats. Strata PAH is available for clean up of water samples.

strata
Solid Phase Extraction



Strata-X Polymeric SPE

Type: Solid Phase Extraction

Description: Unique, combined reverse phase and ion-exchange polymeric media developed to cover a diverse spectrum of analytes and simplify the method development process for fast and efficient sample preparation. Available in tubes (ranging from 1 mL to 60 mL) and standard and microelution 96-well plate formats.

strata
Polymeric SPE



Ordering Information

Kinetex®

3.5 µm Minibore Columns (mm)				SecurityGuard™ ULTRA Cartridges (mm)
Phase	50 x 2.1	100 x 2.1	150 x 2.1	3/pk
PAH	00B-4764-AN	00D-4764-AN	00F-4764-AN	AJ0-9535 for 2.1 mm ID

3.5 µm MidBore™ (mm)		SecurityGuard ULTRA Cartridges (mm)
Phase	100 x 3.0	3/pk
PAH	00D-4764-Y0	AJ0-9534 for 3.0 mm ID

3.5 µm Analytical Columns (mm)				SecurityGuard ULTRA Cartridges (mm)
Phase	100 x 4.6	150 x 4.6	250 x 4.6	3/pk
PAH	00D-4764-E0	00F-4764-E0	00G-4764-E0	AJ0-9533 for 4.6 mm ID

*SecurityGuard ULTRA Cartridges require holder, Part No.: AJ0-9000

Zebtron™

Phase	ID (mm)	df (µm)	Length (m)	Part No.
ZB-PAH	0.18	0.14	20	7FD-G038-47
ZB-PAH	0.25	0.25	30	7HG-G038-11
ZB-PAH	0.25	0.25	60	7KG-G038-11

Sample Preparation

Find part numbers, phases and sizes for our sample preparation solutions through the following links:

roQ™ QuEChERS:

www.phenomenex.com/roQ

Strata® Silica SPE

www.phenomenex.com/strata

Strata-X Polymeric SPE

www.phenomenex.com/strata-x



If Phenomenex LC and GC columns in this brochure do not provide at least equivalent separations to a competing column of the same phase, particle size, and dimensions, return the Phenomenex column with comparative data within 45 days for a FULL REFUND.

PAH Priority Analysis

Find more methods and applications online at
www.phenomenex.com/PAH

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Strata-X is patented by Phenomenex. U.S. Patent No. 7,119,145.

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