

Analysis of Polyaromatic Hydrocarbons Using the Hitachi LaChrom Elite® HPLC System with DAD Detection

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Polyaromatic hydrocarbons (PAHs) are molecules consisting of carbon and hydrogen that contain three or more aromatic rings. They are components of air pollution from the combustion of fuel, and have also been found in cigarette smoke and grilled or smoked meat. Several PAHs have confirmed carcinogenic activity, and as such, analysis of these components is essential. Here we describe a method for analysis of PAHs by HPLC with diode array detection. The data here specifically describe the analysis of a 16 component mixture of PAHs with diode array detection in under sixteen minutes.¹

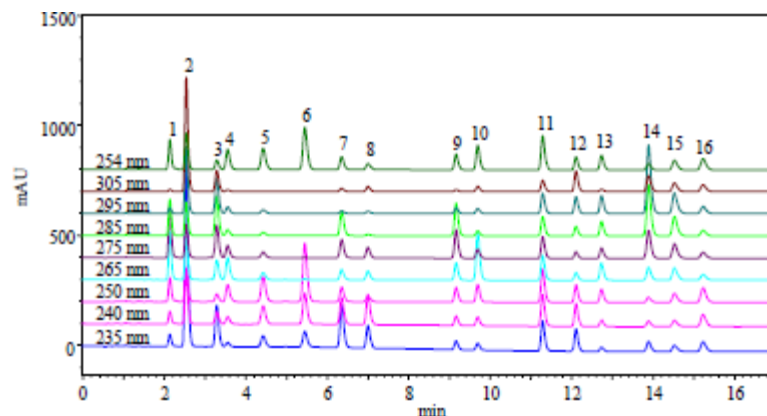
Experimental Conditions

Module	Conditions
Pump (L-2130)	Mobile Phase A: 60% CH ₃ CN, 40% H ₂ O Mobile Phase B: CH ₃ CN Gradient Program* Flow Rate: 0.75 mL/min
Autosampler (L-2200)	Injection Volume: 5 µL
Oven (L-2300)	Temperature: 25 °C
Detector (L-2455)	DAD, 220-400 nm
Column	Supelcosil™ LC-PAH 3µm, 3.0 x 100 mm
Standard	SS EPA 610 Polynuclear Aromatic Hydrocarbons Mix

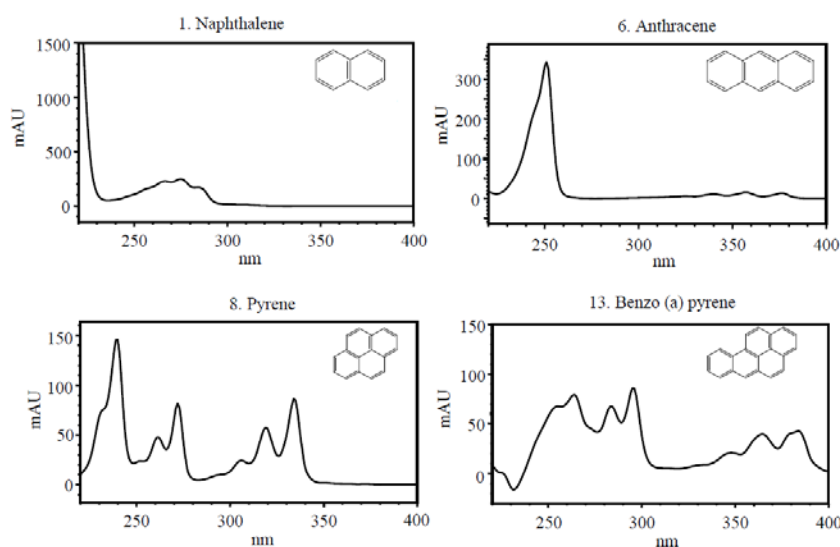
*Gradient Program

Time (min.)	A	B
0.0	100	0
2.0	100	0
10.3	0	100
17.0	0	100
17.1	100	0
24.0	100	0

Results – Chromatogram of 16-Component PAH Mixture: 1) naphthalene, 2) acenaphthylene, 3) acenaphthene, 4) fluorene, 5) phenanthrene, 6) anthracene, 7) fluoranthene, 8) pyrene, 9) benzo (a) anthracene, 10) crysene, 11) benzo (b) fluoranthene, 12) benzo (k) fluoranthene, 13) benzo (a) pyrene, 14) dibenzo (a,h) anthracene, 15) benzo (ghi) perylene, 16) indeno (1,2,3-c,d) pyrene



Results – Select PAH Spectra



Discussion

Hitachi's LaChrom Elite® liquid chromatography system with diode array detection is extremely effective at simultaneous analysis of multiple polyaromatic hydrocarbons in under 16 minutes.

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Reference:

1 – Technical Data LC-090006, Hitachi High Technologies Corporation.

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