



**EPA-PAH-STK**

**Polycyclic Aromatic Hydrocarbon (PAH)  
Native Stock Solution**

**PRODUCT CODE:** EPA-PAH-STK  
**LOT NUMBER:** EPAPAHSTK1116  
**SOLVENT(S):** Toluene  
**DATE PREPARED:** (mm/dd/yyyy) 11/22/2016  
**LAST TESTED:** (mm/dd/yyyy) 09/16/2019  
**EXPIRY DATE:** (mm/dd/yyyy) 04/01/2026  
**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place

**DESCRIPTION:**

EPA-PAH-STK is a solution/mixture of polycyclic aromatic hydrocarbons (PAHs). The components and their concentrations are given in Table A.

Each of the individual PAHs has a chemical purity of >98%.

**DOCUMENTATION/ DATA ATTACHED:**

Table A: Components and Concentrations of the Solution/Mixture  
Figure 1: HRGC/LRMS Data (TIC)  
Figure 2: HRGC/LRMS Data (Individual Mass Spectra)

**ADDITIONAL INFORMATION:**

- See page 2 for further details.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

**INTENDED USE:**

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

**HANDLING:**

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

**SYNTHESIS / CHARACTERIZATION:**

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

**HOMOGENEITY:**

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

**UNCERTAINTY:**

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters  $x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where  $x$  is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

**TRACEABILITY:**

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

**EXPIRY DATE / PERIOD OF VALIDITY:**

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

**QUALITY MANAGEMENT:**

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

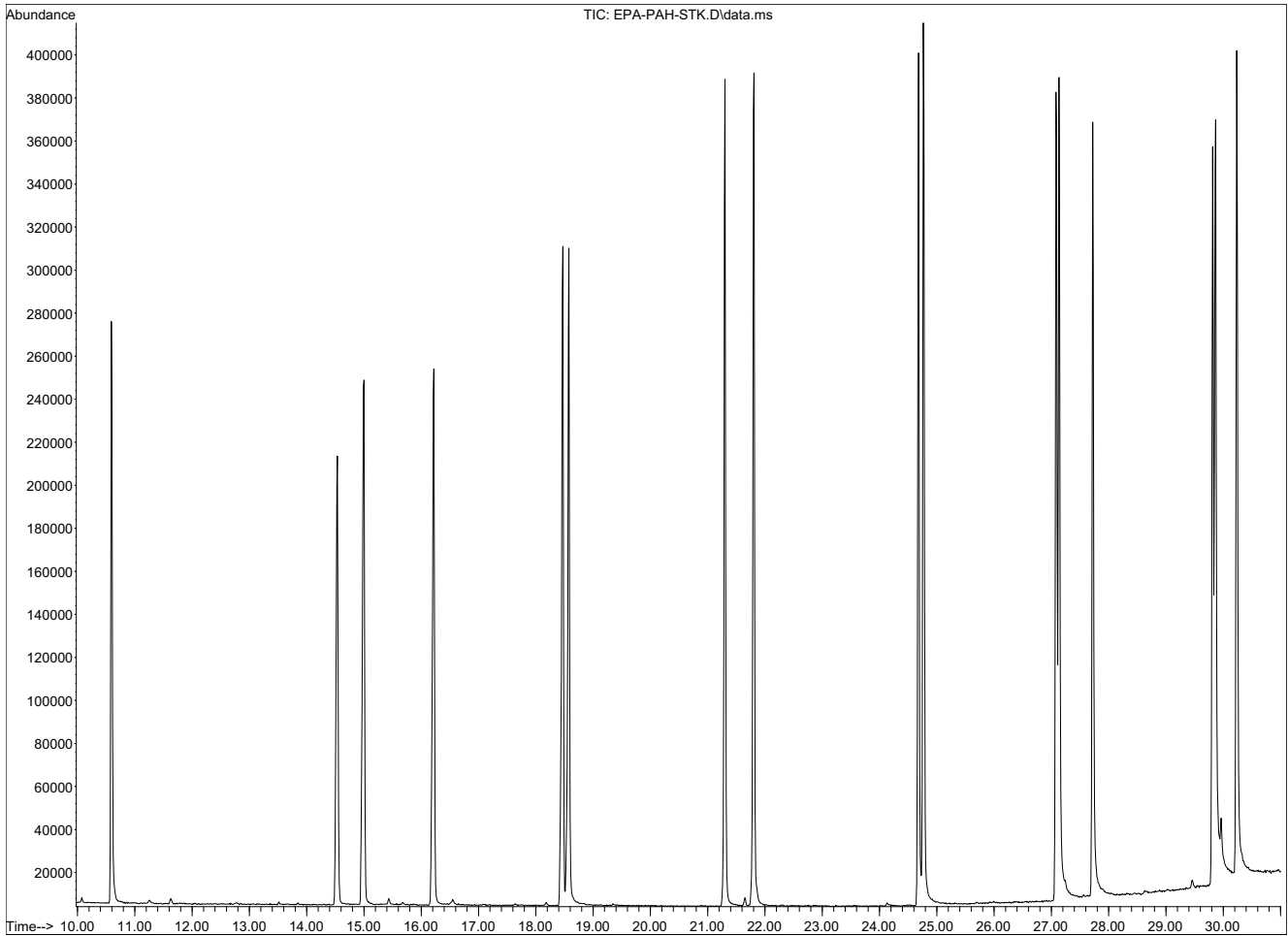
**Table A: EPA-PAH-STK; Components and Concentrations ( $\mu\text{g/ml}$ ,  $\pm 5\%$  in toluene)**

Compound	CAS #	Concentration ( $\mu\text{g/ml}$ )	Peak ID (see Figures 1b & 1c)
Naphthalene	91-20-3	5.0	A
Acenaphthylene	208-96-8	5.0	B
Acenaphthene	83-32-9	5.0	C
Fluorene	86-73-7	5.0	D
Phenanthrene	85-01-8	5.0	E
Anthracene	120-12-7	5.0	F
Fluoranthene	206-44-0	5.0	G
Pyrene	129-00-0	5.0	H
Benzo[a]anthracene	56-55-3	5.0	I
Chrysene	218-01-9	5.0	J
Benzo[b]fluoranthene	205-99-2	5.0	K
Benzo[k]fluoranthene	207-08-9	5.0	L
Benzo[a]pyrene	50-32-8	5.0	M
Indeno[1,2,3-c,d]pyrene	193-39-5	5.0	N
Dibenzo[a,h]anthracene	53-70-3	5.0	O
Benzo[g,h,i]perylene	191-24-2	5.0	P

Certified By:   
B.G. Chittim, General Manager

Date: 09/23/2019  
(mm/dd/yyyy)

**Figure 1a: EPA-PAH-STK; HRGC/LRMS (TIC Chromatogram)**



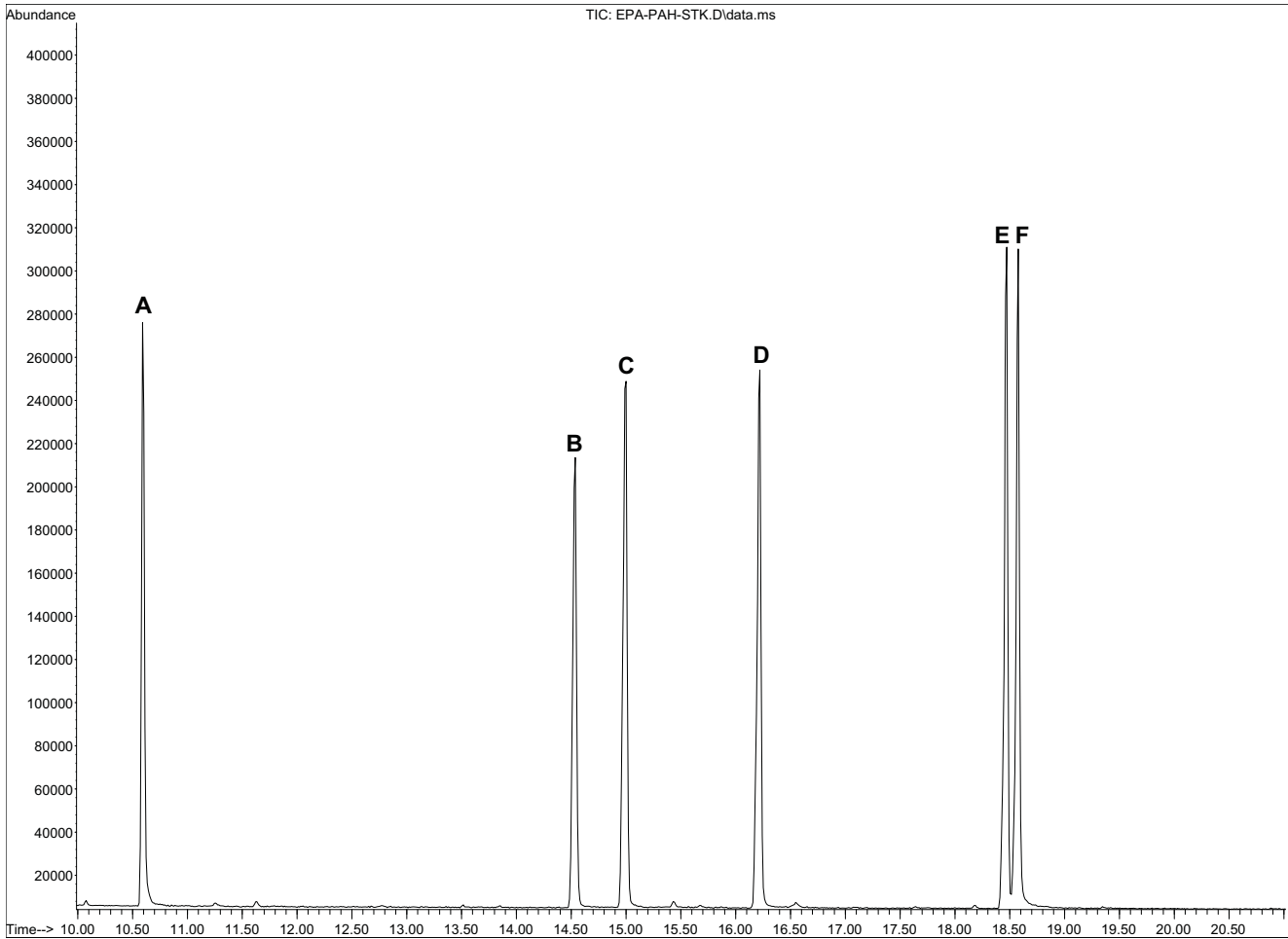
**HRGC/LRMS:**

Agilent 7890A (HRGC)  
Agilent 5975C (LRMS)

**Chromatographic Conditions:**

Column: 30 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W  
Injector: 250 °C (Splitless Injection)  
Oven: 70 °C (5 min)  
10 °C/min to 325 °C  
325 °C (15 min)  
Ionization: EI+  
Detector: 250 °C  
Full Scan (50-1000 amu)

**Figure 1b: EPA-PAH-STK; HRGC/LRMS (TIC Chromatogram)**



**HRGC/LRMS:**

Agilent 7890A (HRGC)  
Agilent 5975C (LRMS)

**Chromatographic Conditions:**

Column: 30 m DB-5 (0.25 mm id, 0.25  $\mu$ m film thickness) Agilent J&W

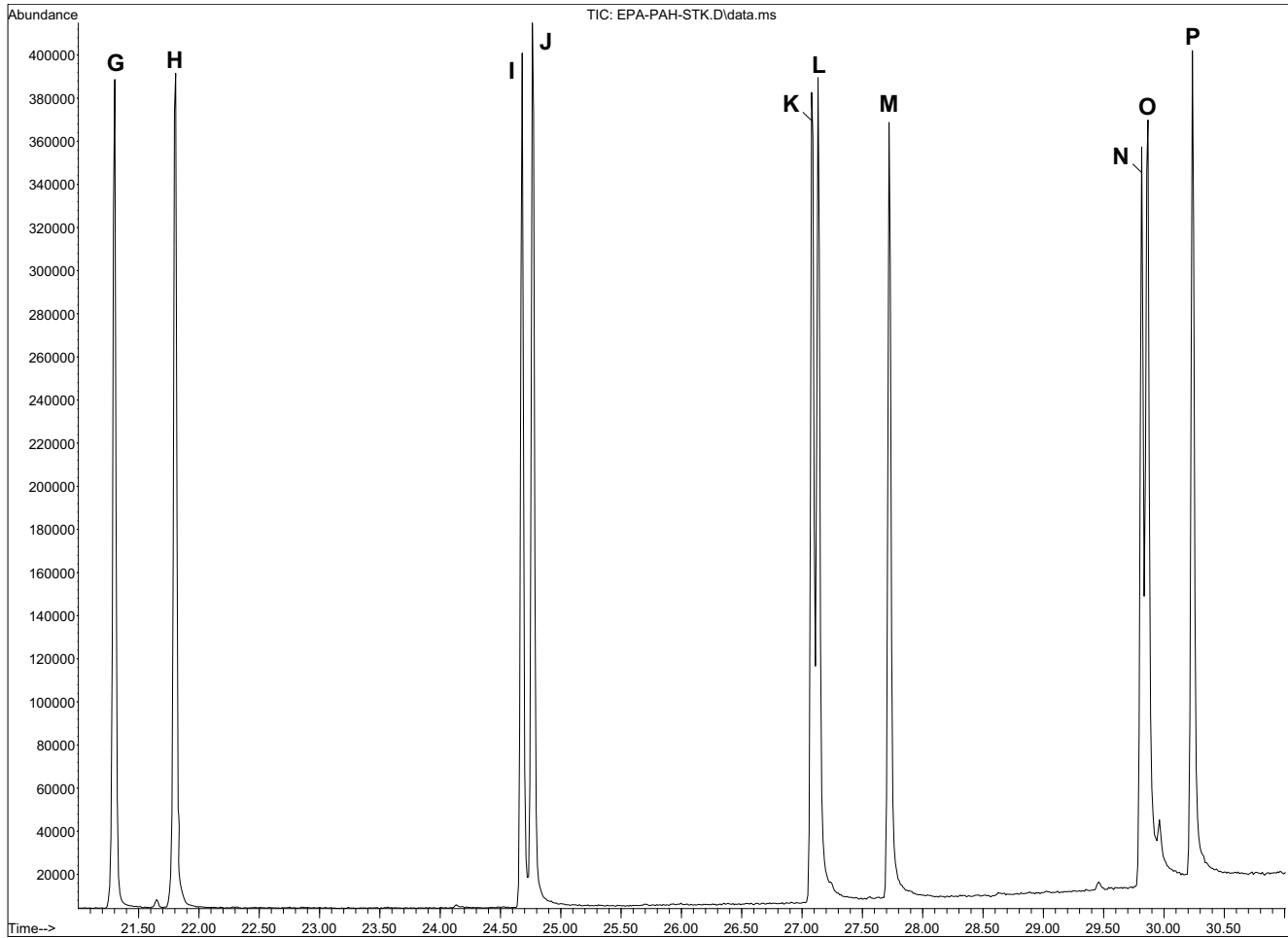
Injector: 250 °C (Splitless Injection)

Oven: 70 °C (5 min)  
10 °C/min to 325 °C  
325 °C (15 min)

Ionization: EI+

Detector: 250 °C  
Full Scan (50-1000 amu)

**Figure 1c: EPA-PAH-STK; HRGC/LRMS (TIC Chromatogram)**



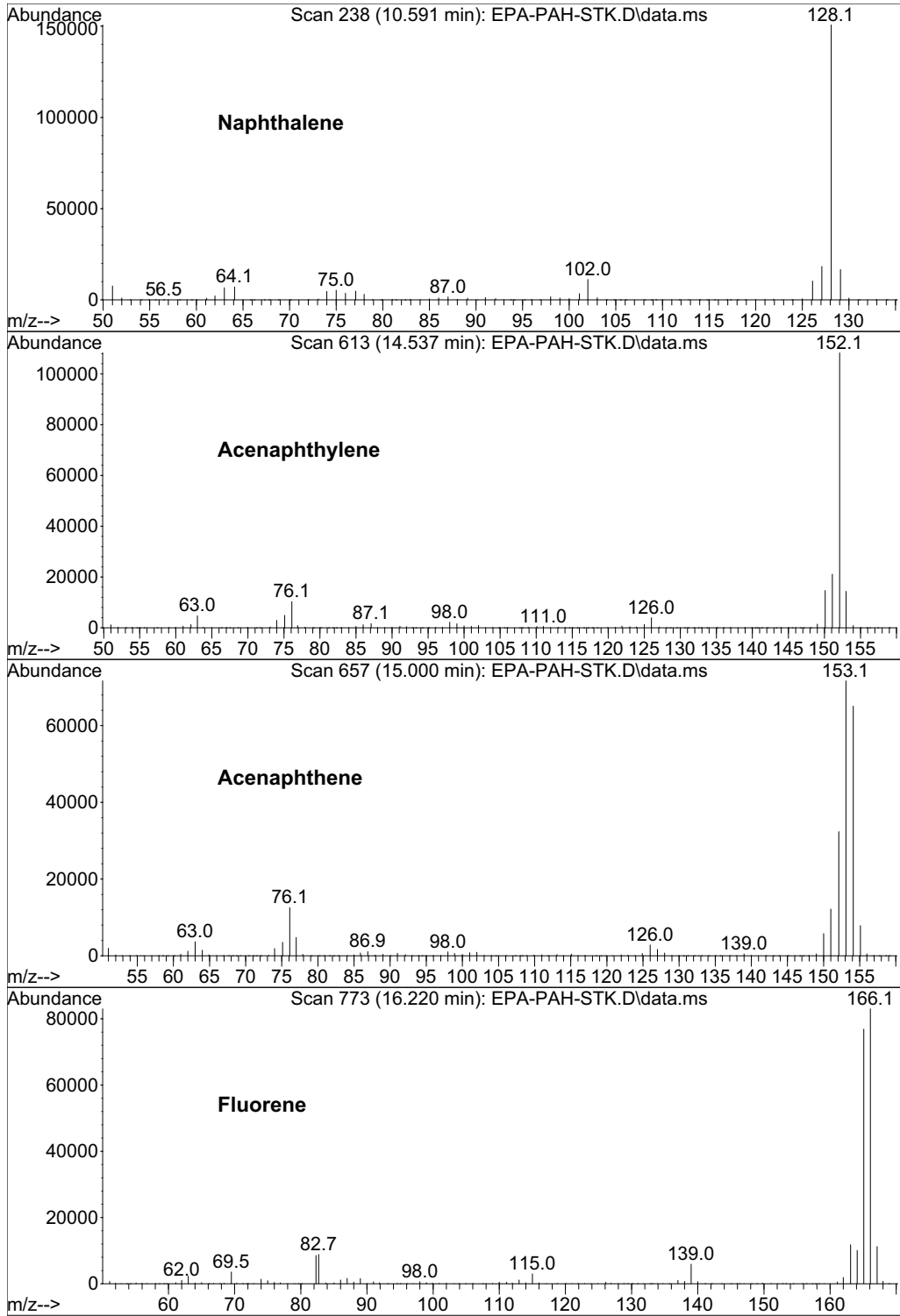
**HRGC/LRMS:**

Agilent 7890A (HRGC)  
Agilent 5975C (LRMS)

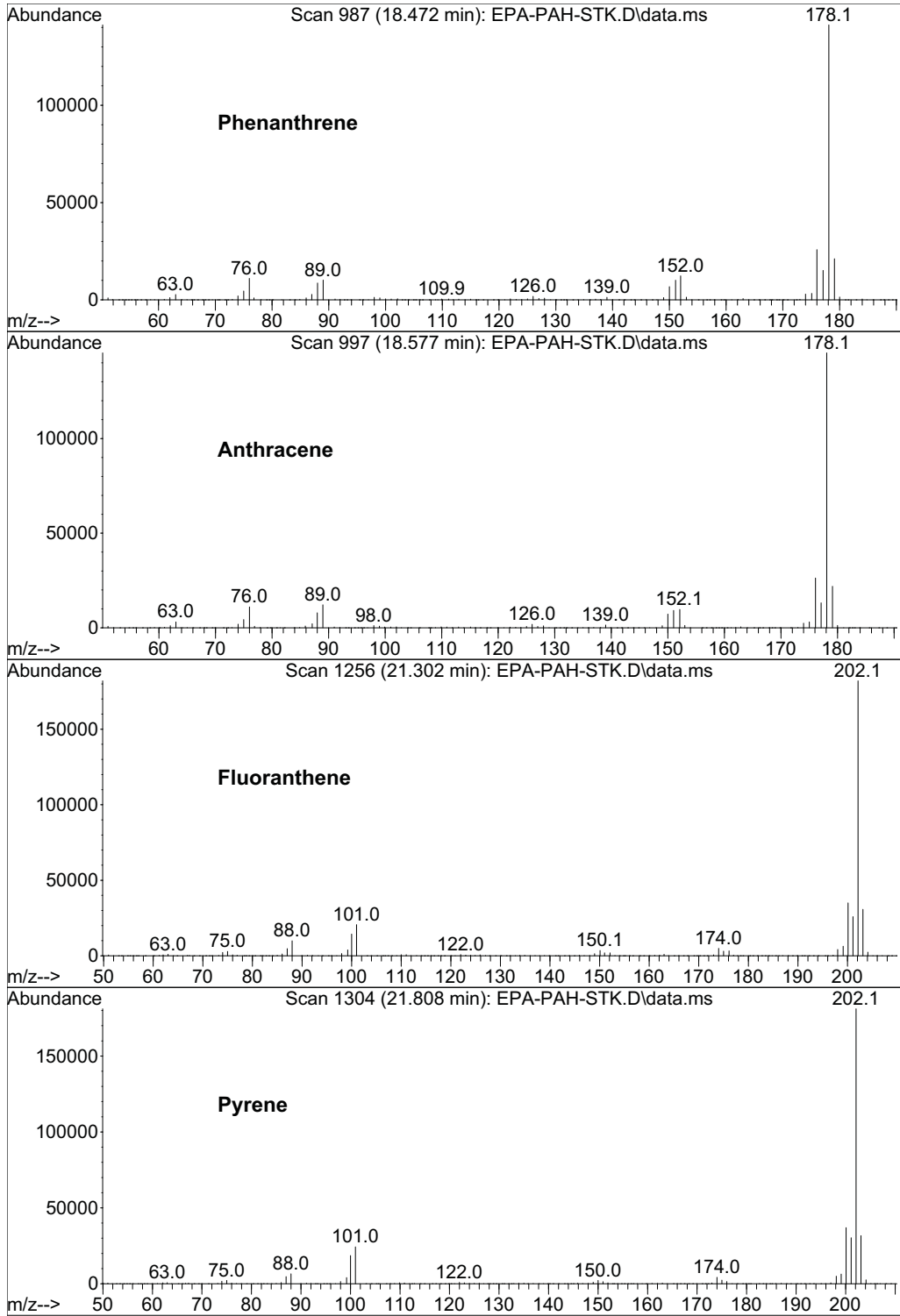
**Chromatographic Conditions:**

Column: 30 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W  
Injector: 250 °C (Splitless Injection)  
Oven: 70 °C (5 min)  
10 °C/min to 325 °C  
325 °C (15 min)  
Ionization: EI+  
Detector: 250 °C  
Full Scan (50-1000 amu)

**Figure 2: EPA-PAH-STK; Individual Mass Spectra**

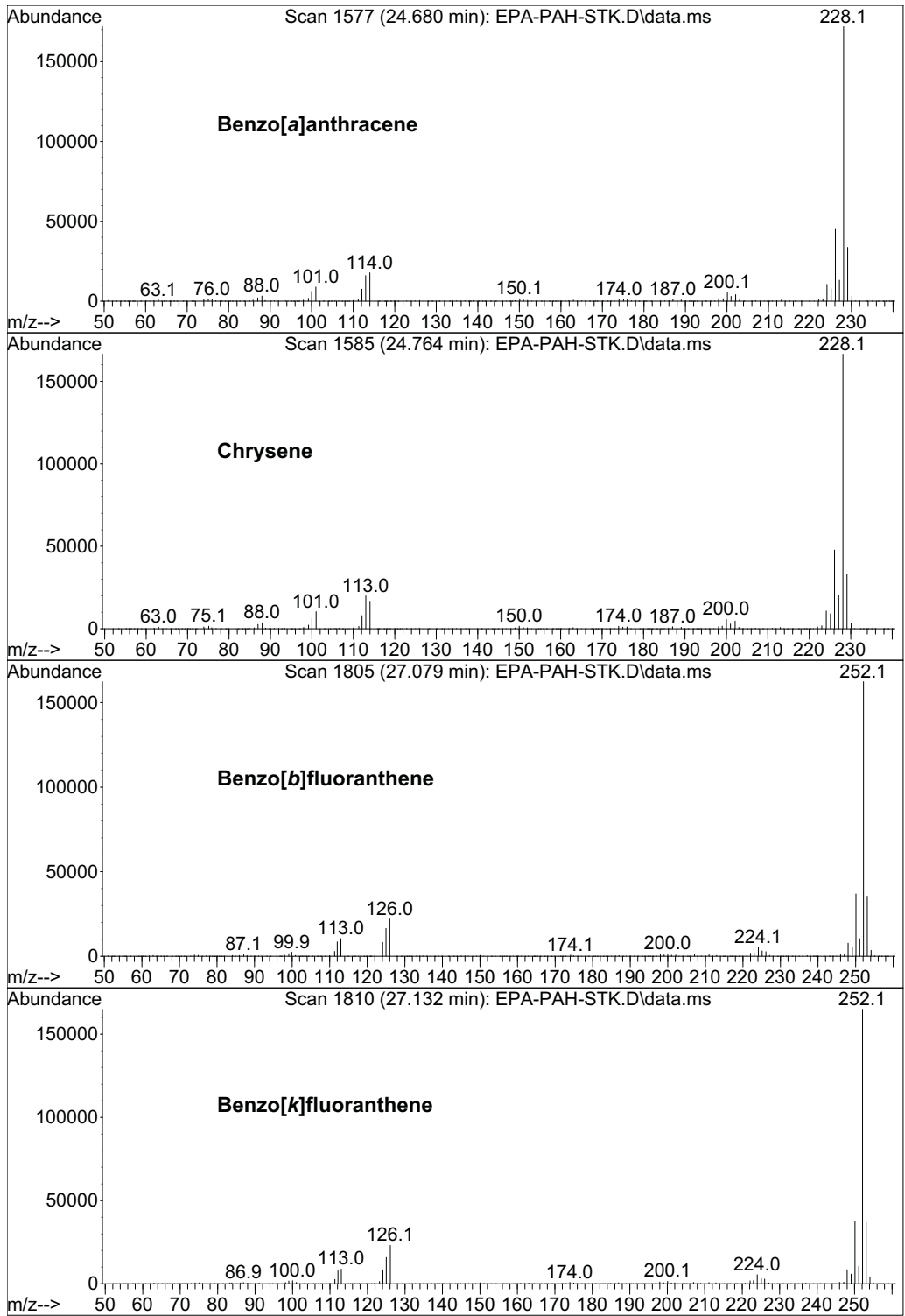


**Figure 2: EPA-PAH-STK; Individual Mass Spectra**





**Figure 2: EPA-PAH-STK; Individual Mass Spectra**



**Figure 2: EPA-PAH-STK; Individual Mass Spectra**

