



April 20, 2012

## **NEW CALIBRATION SET: PAH-CVS-B**

### **New Polyaromatic Hydrocarbon (PAH) Calibration Set and Support Solutions**

Wellington currently offers **PAH-CVS-A** and **L429-CVS** as ready to use calibration sets for the HRGC/HRMS analysis of polyaromatic hydrocarbons (PAHs). **PAH-CVS-B** is being introduced to complement our existing PAH calibration sets and, in order to better suit the needs of our customers, this calibration set contains an increased number and selection of native PAHs (including benzo[c]fluorene).

Summarized in the table below are the individual PAHs to be analyzed according to the European Union (15+1 priority PAHs), the US EPA (various methods; 16 PAHs), and the California EPA Air Resources Board (CARB Method 429).

**PAH-CVS-B** contains all of these PAHs and thus satisfies the requirements of a number of jurisdictions and their related agencies.

PAH	15+1 EU PAHs	US EPA; 16 PAHs	CARB 429
Naphthalene		‡	×
2-Methylnaphthalene			×
Acenaphthylene		‡	×
Acenaphthene		‡	×
Fluorene		‡	×
Phenanthrene		‡	×
Anthracene		‡	×
Fluoranthene		‡	×
Pyrene		‡	×
Benzo[c]fluorene	†		
Cyclopenta[c,d]pyrene	†		
Benz[a]anthracene	†	‡	×
Chrysene	†	‡	×
5-Methylchrysene	†		
Benzo[b]fluoranthrene	†	‡	×
Benzo[j]fluoranthrene	†		
Benzo[k]fluoranthrene	†	‡	×
Benzo[e]pyrene			×
Benzo[a]pyrene	†	‡	×
Perylene			×
Indeno[1,2,3-c,d]pyrene	†	‡	×
Benzo[g,h,i]perylene	†	‡	×
Dibenz[a,h]anthracene	†	‡	×
Dibenzo[a,i]pyrene	†		
Dibenz[a,e]pyrene	†		
Dibenz[a,j]pyrene	†		
Dibenzo[a,h]pyrene	†		

**PAH-CVS-B** includes five calibration solutions ranging in concentration from 2 ng/ml to 1000 ng/ml (see Table A) and can be used with the following support solutions:

**PAH-STK-B:** PAH Native Stock Solution (27 components - see Table B)

**PAH-LCS-B:** PAH Labelled Compound Solution (16 components - see Table C)

**PAH-ISS-B:** PAH Internal Standard Spiking Solution (3 components - see Table D)

**PAH-SS-B:** PAH Sampling Standard Solution (2 components - see Table E)



**Table A: PAH-CVS-B; Components and Concentrations (ng/ml; isooctane/toluene)**

Native Compounds	CAS #	PAH-B-CS1	PAH-B-CS2	PAH-B-CS3	PAH-B-CS4	PAH-B-CS5
Naphthalene	91-20-3	2	10	50	250	1000
2-Methylnaphthalene	91-57-6	2	10	50	250	1000
Acenaphthylene	208-96-8	2	10	50	250	1000
Acenaphthene	83-32-9	2	10	50	250	1000
Fluorene	86-73-7	2	10	50	250	1000
Phenanthrene	85-01-8	2	10	50	250	1000
Anthracene	120-12-7	2	10	50	250	1000
Fluoranthene	206-44-0	2	10	50	250	1000
Pyrene	129-00-0	2	10	50	250	1000
Benzo[c]fluorene	205-12-9	2	10	50	250	1000
Cyclopenta[c,d]pyrene	27208-37-3	2	10	50	250	1000
Benz[a]anthracene	56-55-3	2	10	50	250	1000
Chrysene	218-01-9	2	10	50	250	1000
5-Methylchrysene	3697-24-3	2	10	50	250	1000
Benzo[b]fluoranthene	205-99-2	2	10	50	250	1000
Benzo[k]fluoranthene	207-08-9	2	10	50	250	1000
Benzo[j]fluoranthene	205-82-3	2	10	50	250	1000
Benzo[e]pyrene	192-97-2	2	10	50	250	1000
Benzo[a]pyrene	50-32-8	2	10	50	250	1000
Perylene	77392-71-3	2	10	50	250	1000
Indeno[1,2,3-c,d]pyrene	193-39-5	2	10	50	250	1000
Benzo[g,h,i]perylene	191-24-2	2	10	50	250	1000
Dibenz[a,h]anthracene	53-70-3	2	10	50	250	1000
Dibenzo[a,l]pyrene	191-30-0	2	10	50	250	1000
Dibenzo[a,e]pyrene	192-65-4	2	10	50	250	1000
Dibenzo[a,i]pyrene	189-55-9	2	10	50	250	1000
Dibenzo[a,h]pyrene	189-64-0	2	10	50	250	1000
<b>PAH-LCS-B (Extraction Standards)</b>						
Naphthalene-d <sub>8</sub>	1146-65-2	100	100	100	100	100
2-Methylnaphthalene-d <sub>10</sub>	7297-45-2	100	100	100	100	100
Acenaphthylene-d <sub>8</sub>	93951-97-4	100	100	100	100	100
Phenanthrene-d <sub>10</sub>	1517-22-2	100	100	100	100	100
Anthracene-d <sub>10</sub>	1719-06-8	100	100	100	100	100
Fluoranthene-d <sub>10</sub>	93951-69-0	100	100	100	100	100
Benz[a]anthracene-d <sub>12</sub>	1718-53-2	100	100	100	100	100
Chrysene-d <sub>12</sub>	1719-03-5	100	100	100	100	100
Benzo[b]fluoranthene-d <sub>12</sub>	93951-98-5	100	100	100	100	100
Benzo[k]fluoranthene-d <sub>12</sub>	93952-01-3	100	100	100	100	100
Benzo[a]pyrene-d <sub>12</sub>	63466-71-7	100	100	100	100	100
Perylene-d <sub>12</sub>	1520-96-3	100	100	100	100	100
Indeno[1,2,3-c,d]pyrene-d <sub>12</sub>	203578-33-0	100	100	100	100	100
Benzo[g,h,i]perylene-d <sub>12</sub>	93951-66-7	100	100	100	100	100
Dibenz[a,h]anthracene-d <sub>14</sub>	13250-98-1	100	100	100	100	100
Dibenzo[a,i]pyrene-d <sub>14</sub>	158776-07-9	100	100	100	100	100
<b>PAH-ISS-B (Recovery Standards)</b>						
Acenaphthene-d <sub>10</sub>	15067-26-2	100	100	100	100	100
Pyrene-d <sub>10</sub>	1718-52-1	100	100	100	100	100
Benzo[e]pyrene-d <sub>12</sub>	205440-82-0	100	100	100	100	100
<b>PAH-SS-B (Sampling Standards)</b>						
Fluorene-d <sub>10</sub>	81103-79-9	100	100	100	100	100
p-Terphenyl-d <sub>14</sub>	1718-51-0	100	100	100	100	100



**Table B: PAH-STK-B; Components and Concentrations (ng/ml; isooctane/toluene/nonane)**

Native PAH Compounds	CAS #	Concentration (ng/ml)
Naphthalene	91-20-3	2500
2-Methylnaphthalene	91-57-6	2500
Acenaphthylene	208-96-8	2500
Acenaphthene	83-32-9	2500
Fluorene	86-73-7	2500
Phenanthrene	85-01-8	2500
Anthracene	120-12-7	2500
Fluoranthene	206-44-0	2500
Pyrene	129-00-0	2500
Benzo[c]fluorene	205-12-9	2500
Cyclopenta[c,d]pyrene	27208-37-3	2500
Benz[a]anthracene	56-55-3	2500
Chrysene	218-01-9	2500
5-Methylchrysene	3697-24-3	2500
Benzo[b]fluoranthene	205-99-2	2500
Benzo[k]fluoranthene	207-08-9	2500
Benzo[j]fluoranthene	205-82-3	2500
Benzo[e]pyrene	192-97-2	2500
Benzo[a]pyrene	50-32-8	2500
Perylene	77392-71-3	2500
Indeno[1,2,3-c,d]pyrene	193-39-5	2500
Benzo[g,h,i]perylene	191-24-2	2500
Dibenz[a,h]anthracene	53-70-3	2500
Dibenzo[a,l]pyrene	191-30-0	2500
Dibenzo[a,e]pyrene	192-65-4	2500
Dibenzo[a,i]pyrene	189-55-9	2500
Dibenzo[a,h]pyrene	189-64-0	2500

**Table C: PAH-LCS-B; Components and Concentrations (ng/ml; isooctane/toluene)**

PAH	CAS #	Concentration (ng/ml)
Naphthalene-d <sub>8</sub>	1146-65-2	5000
2-Methylnaphthalene-d <sub>10</sub>	7297-45-2	5000
Acenaphthylene-d <sub>8</sub>	93951-97-4	5000
Phenanthrene-d <sub>10</sub>	1517-22-2	5000
Anthracene-d <sub>10</sub>	1719-06-8	5000
Fluoranthene-d <sub>10</sub>	93951-69-0	5000
Benzo[a]anthracene-d <sub>12</sub>	1718-53-2	5000
Chrysene-d <sub>12</sub>	1719-03-5	5000
Benzo[b]fluoranthene-d <sub>12</sub>	93951-98-5	5000
Benzo[k]fluoranthene-d <sub>12</sub>	93952-01-3	5000
Benzo[a]pyrene-d <sub>12</sub>	63466-71-7	5000
Perylene-d <sub>12</sub>	1520-96-3	5000
Indeno[1,2,3-c,d]pyrene-d <sub>12</sub>	203578-33-0	5000
Benzo[g,h,i]perylene-d <sub>12</sub>	93951-66-7	5000
Dibenz[a,h]anthracene-d <sub>14</sub>	13250-98-1	5000
Dibenzo[a,i]pyrene-d <sub>14</sub>	158776-07-9	5000



**Table D:** PAH-ISS-B; Components and Concentrations (ng/ml; isooctane/toluene)

PAH	CAS #	Concentration (ng/ml)
Acenaphthene-d <sub>10</sub>	15067-26-2	5000
Pyrene-d <sub>10</sub>	1718-52-1	5000
Benzo[e]pyrene-d <sub>12</sub>	205440-82-0	5000

**Table E:** PAH-SS-B; Components and Concentrations (ng/ml; isooctane/toluene)

PAH	CAS #	Concentration (ng/ml)
Fluorene-d <sub>10</sub>	81103-79-9	5000
<i>p</i> -Terphenyl-d <sub>14</sub>	1718-51-0	5000

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