

## Extraction of polynuclear aromatic hydrocarbons (PAHs) using Resprep™-18-47 SPE disks and Resprep™-6D extraction system

### Sample Pretreatment

Allow 1L of deionized water to equilibrate to room temperature. Adjust sample pH to less than 2 with 6N HCl. Add 5mL of methanol and mix thoroughly. For QA/QC samples, spike with 1mL of a 2µg/mL solution for a final concentration in the water of 2ppb.

### Apparatus Assembly

Assemble the Diskcover™-47 extraction disk holder with reservoir, making sure the Teflon® o-ring is in place. Also be sure to place the C18 disk in the Diskcover™-47 extraction disk holder *wrinkled side up*. Assemble the Resprep™-6D extraction system as detailed in its instruction sheet, along with the vacuum pump, vacuum line, and vacuum trap.

### Disk Precleaning

Add 10mL of methylene chloride to the top surface of the disk and immediately draw it through under vacuum at 15 in. Hg. Continue to draw vacuum at 15 in. Hg for 5 minutes, removing all solvent.

### Disk Conditioning

Add 10mL of methanol to the top surface of the disk and let stand for a few minutes. Draw the methanol through the disk until the methanol's top surface is just above the disk. **Do not allow any air to pass through the disk or reach the top surface of the disk.** Note: It is preferable to leave extra liquid above the disk rather than allow any air to contact the disk surface.

### Sample Addition

Pour the sample into the Diskcover™-47 reservoir, adding it directly to the film of methanol left on the disk from the conditioning step. Adjust the vacuum to approximately 25 in. Hg.

### Disk Drying

After the entire sample has been processed, draw air through the disk under vacuum to remove any residual water from the disk.

### Analyte Elution

Release system vacuum. Insert the collection rack and vessels into the glass chamber, making sure to label each vessel with the corresponding Diskcover™-47. Reassemble the Resprep™-6D extraction system. Add 5mL methylene chloride directly to the sample bottle, and gently swirl to rinse all inner surfaces of the bottle. Transfer the methylene chloride to the disk using a glass pipette and rinse the reservoir sides in the process. Let the solvent stand for three minutes. Draw the solvent through the disk at 5 in. Hg. Repeat the bottle rinse and disk elution once more with a fresh aliquot of methylene chloride, combining all eluates in the collection tube.



*Resprep™ sample preparation products allow complete, clean sample extraction for more accurate PAH analyses.*

Table I

Accuracy/precision data from seven determinations of PAHs in distilled water at 2µg/L  
using the Resprep™ -C18-47 glass fiber extraction disk.

Compounds	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Average	SD
naphthalene	65.7	78.8	73.7	67.7	73.5	80.8	83.0	74.7	6.5
2-methylnaphthalene	71.9	88.0	84.3	77.3	86.3	97.5	91.6	85.3	8.6
1-methylnaphthalene	75.2	90.9	86.1	81.2	87.2	99.5	96.2	88.0	8.4
biphenyl	77.1	95.0	90.5	84.1	91.5	103.2	102.1	91.9	9.3
2,6-dimethylnaphthalene	69.9	84.3	85.3	80.1	82.9	90.2	86.4	82.7	6.5
acenaphthylene	70.5	98.4	90.8	76.2	90.6	100.6	99.7	89.5	11.9
acenaphthene	83.5	102.6	94.9	90.4	97.2	104.3	106.2	97.0	8.2
2,3,6-trimethylnaphthalene	71.2	89.7	85.7	82.6	88.8	84.9	79.5	83.2	6.3
fluorene	83.8	109.0	106.8	95.6	100.9	107.4	107.3	101.5	9.1
phenanthrene	91.7	105.4	110.2	106.6	108.6	108.3	111.9	106.1	6.7
anthracene	81.5	102.0	89.3	77.7	79.4	94.2	98.6	89.0	9.7
2-methylphenanthrene	91.5	111.1	112.5	99.2	109.9	104.1	110.9	105.6	7.8
1-methylphenanthrene	98.3	112.7	112.0	104.6	108.5	107.1	110.1	107.6	5.0
3,6-dimethylphenanthrene	88.7	108.2	105.0	102.4	104.9	103.5	109.2	103.1	6.8
fluoranthene	94.3	112.9	114.6	106.7	111.0	106.6	115.2	108.8	7.3
pyrene	97.7	113.4	112.4	103.9	110.4	107.5	117.8	109.0	6.7
2,3-benzofluorene	101.1	108.3	100.7	91.1	96.3	100.2	106.8	100.6	5.9
benzo(a)anthracene	97.6	109.2	101.6	89.6	94.0	101.1	110.6	100.5	7.6
chrysene	106.9	110.5	103.8	93.8	97.7	104.1	112.7	104.2	6.7
benzo(b)fluoranthrene	95.0	107.1	109.4	99.2	97.4	100.5	116.1	103.5	7.6
benzo(k)fluoranthrene	106.8	107.1	108.4	96.1	99.8	99.7	110.0	104.0	5.3
benzo(e)pyrene	101.3	106.2	106.6	98.8	103.4	101.1	115.9	104.8	5.7
benzo(a)pyrene	101.4	107.2	100.0	88.2	90.4	99.2	105.2	98.8	7.1
perylene	100.9	109.2	97.3	86.1	90.2	96.8	105.7	98.0	8.1
9,10-diphenylanthracene	111.4	119.7	112.0	94.6	98.0	106.0	104.9	106.7	8.6
indeno(1,2,3-cd)pyrene	110.9	119.7	113.3	102.0	105.8	110.3	115.4	111.1	5.9
dibenzo(a,h)anthracene	118.3	125.5	112.4	94.4	107.3	108.3	115.6	111.7	9.8
benzo(g,h,i)perylene	123.4	129.5	119.8	103.2	113.4	113.7	121.3	117.8	8.5
Surrogate Standards									
naphthalene-d8	65.5	83.0	73.8	65.5	75.4	80.2	79.8	74.7	7.0
acenaphthene-d10	86.2	103.6	96.4	87.8	102.6	110.7	106.1	99.1	9.3
phenanthrene-d10	101.7	115.8	122.9	110.8	118.1	129.3	122.5	117.3	9.0
chrysene-d12	125.7	136.5	122.7	105.2	124.0	150.4	170.0	133.5	21.2
perylene-d12	109.7	118.0	105.7	89.1	100.2	105.0	119.4	106.7	10.4

**Restek Trademarks:** Diskcover, Resprep, and the Restek logo. **Other Trademarks:** Teflon (E.I. du Pont de Nemours & Company, Inc.).

For permission to reproduce any portion of this application note, please contact Restek's publications/graphics department by phone (ext. 2128) or FAX.



© Copyright 2000, Restek Corporation

**USA:** 110 Benner Circle, Bellefonte, PA 16823 • phone: (800) 356-1688 • fax: (814) 353-1309  
**Germany:** Schaberweg 23, 61348 Bad Homburg • phone: (49) 06172 2797 0 • fax: (49) 06172 2797 77  
**France:** 1, rue Montespan, 91024 Evry Cedex • phone: (33) 01 60 78 32 10 • fax: (33) 01 60 78 70 90  
**Thames Restek UK Ltd.:** Fairacres Industrial Centre, Dedworth Road, Windsor, Berkshire, SL4 4LE  
 phone: (44) 01753 624111 • fax: (44) 01753 624666  
**Thames Restek Scotland Ltd.:** Dept. 10, 44-46 Morningside Road, Edinburgh, EH10 4BF  
 phone: 0870 241 1247 • fax: 0870 241 0781  
**Restek Ireland:** 8 Baronscourt Lane, Carryduff, Belfast, BT8 8RR • phone/fax: (44)2 890 814 576