



# Empore™ Extraction Disks

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## Method Summary

Proposed SPE Disk Method for Aqueous Phase EPA Quick Turnaround Methods (QTM):

Phenols

### Summary

A water sample (100 ml) is passed through a 47 mm Styrene divinylbenzene (SDB) Empore™ disk and eluted with methylene chloride. The extract is dried, reduced in volume and analyzed by GC/FID. If interfering compounds are present, a clean-up protocol is described in the EPA QTM method.

#### PERFORMANCE DATA

<u>Analyte</u>	<u>High Level<sup>a</sup></u>		<u>Low Level<sup>b</sup></u>	
	<u>Ave</u> <u>% R</u>	<u>%</u> <u>RSD</u>	<u>Ave</u> <u>% R</u>	<u>%</u> <u>RSD</u>
Phenol	46.2	5.2	16.3	4.6
2-Chlorophenol	85.3	3.7	56.5	5.7
2-Methylphenol	89.0	3.7	56A	5.8
3-Methylphenol	87.8	3.5	52.4	6.0
2-Nitrophenol	85.7	3.4	67.6	6.1
2,4-Dimethylphenol	87.7	3.5	74.4	13.0
2,4-Dichlorophenol	92.7	6.3	79.1	11.0
4-Chloro-3-Methylphenol	88.4	3.4	84.8	9.1
2,4,6-Trichlorophenol	87.1	3.0	85.0	8.8
2,4-Dinitrophenol	87.6	5.4	81.3	1.2
4-Mtrophenol	88.6	5.9	57.3	2.2
2,3,4,6-Tetrachlorophenol	88.0	3.9	88.3	7.2
2-Methyl-4,6-dinitrophenol	85.0	5.8	87.9	6.2
Pentachlorophenol	89.5	5.3	92.9	6.3
2-Bromophenol <sup>c</sup>	86.1	3.5	70.2	9.4

<sup>a</sup> Compounds spiked at 500 ppb into groundwaters from two different hazardous waste sites. n=6.

<sup>b</sup> Compounds spiked at 50 ppb into groundwater from a hazardous waste site. n=3

<sup>c</sup> Surrogate compound

### Method

1. Place a 47 mm SDB Empore disk on the base unit of a glass filtration assembly (without the reservoir and clamp). Use of a manifold for multiple extractions is acceptable.

*(When pre-cleaned SDB disks are used, the following pre wash procedure is not necessary. Pre-swelling with acetone; however, will prevent cosmetic "wrinkling" of the disk which will not affect performance.)*

- To swell the resin and pre-wash the SDB disk, pipette 2-4 ml acetone onto the disk surface. Allow to soak for about three minutes. Pull the acetone through and allow the disk to dry. Repeat using 2-4 ml isopropyl alcohol.
2. Place the glass reservoir on the base unit and clamp in place. Wash the extraction apparatus and disk by adding 5 ml of methylene chloride to the reservoir. Pull a small amount through the disk with a vacuum; turn off the vacuum and allow the disk to soak for about one minute. Pull the remaining solvent through the disk and allow the disk to dry.
  3. Condition the disk by adding approximately 5 ml of methanol to the reservoir, pulling a small amount through the disk then letting it soak for about one minute. Pull most of the remaining methanol through the disk, leaving 3-5 mm of methanol on the surface of the disk.
  4. Add 10 ml of reagent water to the disk. Using the vacuum pull most through, again leaving 3-5 mm of water on the surface of the disk.
  5. The pH of the water sample should be  $< 2$ , and the sample modified with 0.5 ml methanol and 5 g NaCl. Add the water sample to the reservoir and filter as quickly as the vacuum will allow. Drain as much water from sample bottle as possible.
  6. Remove filter assembly and insert suitable sample tube for eluate collection.
  7. Add 10 ml of methylene chloride to sample bottle. Rinse bottle thoroughly and set aside momentarily.
  8. Wet the disk with a small amount of acetone - just enough to wet the surface (approximately 0.5 ml or less) and immediately transfer the methylene chloride from the sample bottle to the disk with a dispo-pipette, rinsing the sides of the filtration reservoir in the process.
  9. Pull half of the solvent through the disk then release the vacuum. Allow the remaining methylene chloride to soak the disk for about one minute then draw remainder through under vacuum.
  10. Repeat the solvent rinse of the sample bottle using 5 ml methylene chloride and transfer to the apparatus, rinsing down the sides of the reservoir. Add 5 ml methylene chloride directly on the disk and draw through under vacuum.
  11. Dry the combined eluates with anhydrous sodium sulfate. Rinse the collection tube and sodium sulfate with two 5 ml aliquots of methylene chloride and place combined solvent into a concentrator tube.
  12. Concentrate extract to desired final volume (1 ml) under gentle stream of nitrogen (may be warmed gently - approximately 30 degrees C).
  13. Analyze by GC/FID.

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