Slash Extraction Time & Cost for Paraquat & Diquat Analysis with Resprep"-C8 SPE Disks

- **Faster Extraction Times**
- **Higher Recoveries**
- **Lower cast**
- **Superior to PTF membrane disks**

Paraquat and Diquat are contact herbicides that aid in the defoliation of unwanted vegetation. EPA Method 549.1 is used to determine Paraquat and Diquat contamination in drinking water sources and in finished drinking water.' The method recommends a solid phase extraction disk bonded with C8 material or a C8 adsorbent cartridge to extract these herbicides from water. The most common extraction disk used for this method is the Empore" C8 disk. This disk is a tightly woven PTFE membrane that is prone to slow extraction times and clogging from particulates. The use of Filter Aid 400 is recommended to alleviate some of these problems but adds both time and cost to the procedure. Restek's new glass fiber technology has produced a far superior extraction disk.

Faster Extractions

Restek's new Resprep"-C8 glass-fiber SPE disks offer faster flow rates that result in quicker extractions. Unlike the PTFE extraction disks that rely primarily on surface filtration, the glass fiber disk has a thicker, more open design that allows extractions to take place deep in the filter. This results in less clogging and faster flow rates, even for samples with high particulate matter. Because of the larger pore size, Resprep"-C8 disks run at extraction flow rates of 125-150ml per minute, which is twice the flow rate of PTFE disks. Figure 1 shows a comparison of the extraction times for several different sample types on both the PTFE and Resprep" C8 glass fiber disks. The samples represent a range of different particulate concentrations that are commonly encountered by analytical laboratories.

The glass fiber disk processed air samples much faster than the PTFE disk, but for samples containing particulates, the extraction rate was much more pronounced. For example, the Lake #2 sample extraction time with the disk was 80 minutes, compared to only 30 minutes with the glass fiber disk.

Higher Recovery of Extracted Compounds

Another benefit of the Resprep"-C8 disk is higher recoveries for the large, high molecular weight compounds found in herbicides. The open pore design of the glass fiber disk makes it easier to rinse these compounds off the disk once they have been trapped. Four replicates each of Paraquat and Diquat were analyzed in DI water under the strict guidelines established in Method 549.1. The results in Table I show excellent recovery and standard deviations of Paraquat and Diquat on the Resprep"-C8 disks that are well within the limits specified in the method. With the C8 extraction disk demonstrating method equivalency, laboratories will see improved efficiency and productivity with faster

Figure 1: Glass fiber disks extract samples with particulate matter more than 5 times faster than PTFE membrane disks.

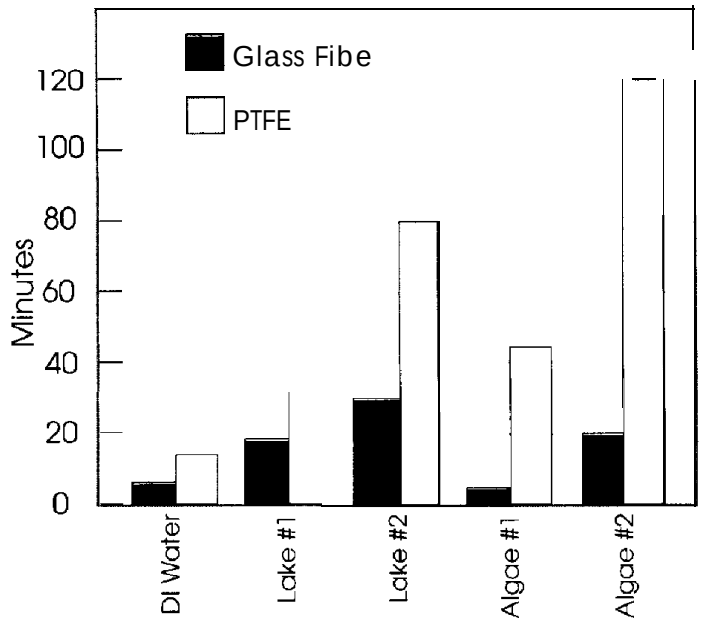


Table I: Resprep"-C8 glass fiber disks meet recovery and reproducibility requirements stated in Method 549.1

Accuracy and Precision Data from Four Determinations of Method 549.1 Analytes (Paraquat and Diquat) using Resprep"-C8 Disk Extraction and Ion-Pair HPLC Analysis with UV Detection.

	Paraquat	Diquat
Sample#1	95.5	88.6
Sample	97.0	89.7
Sample #3	98.4	89.2
Sample #4	93.9	85.5
Average	96.2	88.3
%RSD	1.8	1.9

Concentration -200ug/L of each **analyte**

extraction times and lower extraction disk costs.

Method Equivalences

The EPA has given approval for the use of extraction disks that are chemically equal and meet the QC criteria. The Resprep"-C8 disk and the PTFE disk both contain CS bonded silica and are considered chemically similar. To demonstrate equivalency, the analyst must show that the recovery of the compounds is within the limits established in the method. Since recovery data is required with any disk, whether specified in the method or not, no extra work is involved.

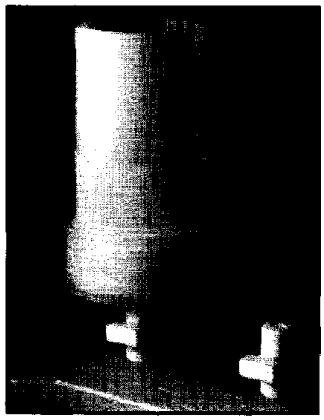
Lower Extraction Costs

In addition to faster extraction times and the elimination of Filter Aid 400, Resprep"-C8 disks cost less than PTFE disks, resulting in savings every time your lab does an extraction. Reduce costs even further with Restek's Resprep"-6D extraction system that processes up to six samples simultaneously.

Further studies of EPA Method Method 549.1

Restek is currently subcontracting a study of Method 549.1 to environmental laboratories to increase our data base on the effectiveness of glass fiber disks compared to PTFE membrane disks. If your laboratory is interested in participating in this study, please call our technical service department at 1-800-356-1688, ext. 4, and ask for more details.

EPA methods are available from NTIS (National Technical Information Service), U.S. Department of Commerce, Springfield, VA, 22161, 703-487-46.50.



Diskcover"-47 Reservoir

Resprep"-C8 SPE Disks: cat.# **24048** 24-pack

Diskcover"-47 Disk Holders: cat.#**24020** each
cat-#**24021** 6-pack

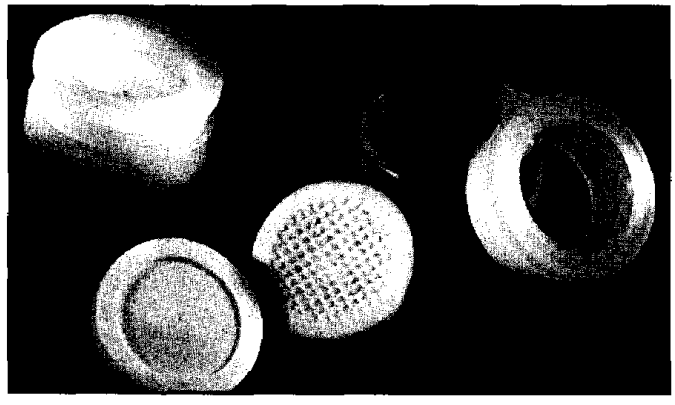
Diskcover" -47 Reservoir: cat.#**24029** each
conjunction with cat.#**24030** 6-pack
Diskcover"-47.

Resprep"-6D Vacuum Extraction System for Diskcover"-47 Disk Holders: cat.# **24000** kit

(Kit includes: propylene top with six sturdy, Teflon flow regulated valves, l/16" Teflon tubing, glass block with built-in vacuum regulator and scratch resistant polypropylene base, six Diskcove"-47 sample extraction disk holders, six pieces of 1/8" Teflon tubing with male Luer to 1/8" tubing adaptor, multi purpose sample holding rack, and convenient valve turning tool.)

Resprep"-6D Extraction Top Retrofit Kit: cat.# **24019** kit

(Kit includes; propylene top with six sturdy, Teflon flow regulation valves, l/16" Teflon tubing. and convenient valve turning tool,)



Diskcover"-47 Extraction *Disk Holders*

For more details on the EPA Method 549.1 extraction procedure, call your local distributor and request the Paraquat/Diquat Application note.

Also available: Application notes on the C18 glass fiber disk showing data on EPA Method 525.1, PAHs, and PCBs.