



### Silica Gel

(silicon hydroxide, SiOH) is also a polar sorbent. The binding mechanism can be either hydrogen or dipole-dipole interaction. It is primarily used to adsorb species from non-polar solvents like hydrocarbons or substituted hydrocarbons and low polarity esters. Elution solvents are usually more polar and include polar esters, ethers, alcohols, acetonitrile or water. Silica can also be used as a medium strength cation exchanger in aqueous solutions. One important use of Silica is to separate polychlorinated biphenyls from oil samples (PCBs were commonly used in transformer oils to improve their electrical breakdown characteristics).

Another "official" application for silica was recently suggested by the USEPA in their proposed method to determine the oil and grease content of aqueous samples. After the sample is treated by traditional extraction techniques (either SPE or liquid/liquid), the hexane eluent is exposed to Silica in order to fractionate the petroleum from non-petroleum based species.

### Alumina

(aluminum oxide, Al<sub>2</sub>O<sub>3</sub>) is available in acidic, basic and neutral grades, and is used in a manner similar to Silica since it has a highly active polar surface. The binding mechanisms also include specific interaction with the pi electrons of aromatic hydrocarbons. This characteristic has been used for applications like crude oil fractionation. Ionic grades

can also be used as low strength ion exchangers. Alumina has often been used for cleaning up homogenates of vegetable samples. Non-polar species are allowed to pass through the Alumina bed while polar extractables from the vegetables are commonly retained on the Alumina. Applications where Alumina has been used include the determination of cosmetic contents, as well as the extraction of basic drugs from blood plasma, organochlorine pesticides from vegetables, and polycyclic aromatic hydrocarbons from animal feeds.

Florisil", Alumina, and Silica have been used for many years in adsorption or extraction chemistry. These sorbents have stood the test of time and have proven to be some of the most useful products available to the laboratory chemist. Whether used as a clean-up device or for analyte concentration, these materials will continue to demonstrate their versatility and utility in laboratories throughout the world.

### RESPREP" 12T SPE Manifold System

Designed specifically for the use of SPE cartridges, such as Florisil", Silica Gel or Alumina, the 12 position manifold has many new improvements over the traditional manifold system. One major weakness in the traditional manifold system is the control valves. We redesigned the valves for inertness and durability. Our valves, constructed of Teflon", mount securely to the manifold top via a durable threaded nut that won't break if side torque is applied against the valve. We made precise flow regulation convenient by providing a valve turning tool that screws into the top plate for storage. The base of the valve was designed to allow 1/16" OD Teflon" tubing to press-fit inside the valve base. Not only does this create a completely inert sample pathway, but it allows inexpensive 1/16" tubing to be cut to the appropriate length for different size collection vessels. The complete Teflon" flow path ensures that your sample will not be contaminated from polypropylene or metal valve parts. Other improvements include a polypropylene base plate with rubber feet so the manifold will not slide and scratch the bench, a multipurpose interior sample rack, and built in legs to support the manifold top.

**Sean's environmental insight keeps Restek on the leading edge of Sample Prep innovations.**

*Sean Randall, Environmental Applications Chemist & Sample Prep Product Manager*

