Vacuum Filtration

Larger Picture

The simplest apparatus is a Vacuum Filtration device。 It consists of three main parts, the filter holder, the funnel, and the clamp. The filter holder is fitted with a sintered disk (either glass, PTFE, or stainless steel, depending upon the composition of the holder) which is porous to the fluid but provides good support for the filter membrane. The funnel is ground so that it sits flat against the membrane filter and the filter holder. After the clamp is applied, the filter is held sufficiently tightly so that fluid will not leak around the membrane. It is extremely important that such leakage not occur, as this would result in some of the fluid bypassing the filter, either contaminating the filtrate with unfiltered material or seeping onto the outside of the funnel.

A vacuum installation does not allow for very high pressure differentials across the filter, since a perfect vacuum will provide a pressure differential of only 1 atmosphere (15 psi, 105 Newton m-2). Thus, a vacuum apparatus can be used for most routine filtrations of small volumes, where accurate control of pressure differential, for the filtration of suspensions containing delicate particles where damage to the particles by pressure must be avoided, vacuum filtration is not desirable unless a vacuum regulator is used. Also, during the filtration of proteinaceous solutions or other biological polymers, foaming downstream of the membrane may occur, causing denaturation.