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MONSANTO CHEMICAL COMPANY - UNIT III
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A NEW DEVICE FOR FILTERING HYDROFLUORIC ACID AND OTHER STRONG ACIDS

(Information Report)

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During the course of a research problem involving hydrofluoric acid it became necessary to filter concentrated hydrofluoric solutions to remove various solid materials. The search for a suitable filter media finally led to the use of a commercially manufactured plastic material known as "Sponge Teflon" (polytetrafluoroethylene) which is produced by the DuPont Company. This material, which comes in 1/8" sheets, is used primarily as a gasket material in acid lines, and is impervious to all acids, including hydrofluoric acid.

A variety of filters have been prepared and tested using this plastic as the filter medium.

1. A Buchner type funnel was machined, as shown in the diagram, Figure 1, from solid teflon using a sheet of sponge teflon as the filter. Using a plastic vacuum bottle this filter, which can be made in any diameter, limited only by the size of teflon rod available, has been used for filtering large volumes of hydrofluoric acid with satisfactory results. A comparison of this filter material with commercially manufactured glass filters, using the rate of flow of water through the filter as the testing method, has shown the sponge teflon, in the original state, to have a pore size of approximately fifteen to twenty microns.

2. Using a "body" machined from polystyrene rod, Figure 2, filter sticks have also been prepared and tested with good results. It was found impractical to use a body of teflon in this case because of the difficulty of fastening the filter disc to the body. Using a polystyrene cement, however, the sponge teflon disc may be cemented to the polystyrene body very easily.

3. It has also been found possible to decrease the pore size of the sponge teflon, and thereby increase the filtering efficiency, simply by compressing the sheet material in a bench vise, or similar device, before cutting out the filter discs. Depending upon the pressure and time of this compression various pore sizes can be attained. One filter so prepared was found to have a pore size of approximately two microns. (See Chart 1.)

Obviously, other acids may and have been filtered through this material with equally good results.

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— FIGURE 1 —
BÜCHNER TYPE FUNNEL
— SCALE: FULL SIZE —

MLM-146

— FIGURE 2 —
FILTER STICK
— SCALE: FULL SIZE —

CEMENTED SPONGE TEFLON DISC

CHART 1

KEUFEL & ESSER CO., N. Y. NO. 389 1/2
10 x 10 to the half inch.
MADE IN U.S.A.