Preparation of Ether.

By P. N. Evans.

It is commonly stated that in the preparation of ether by running alcohol into sulphuric acid kept at about 140 deg. Centigrade, while the operation is nominally a continuous one, the acid acting catalytically, the volume of ether obtainable amounts to only about six times that of the acid used before the action is seriously impaired, soon to cease altogether.

Various causes for this limitation have been suggested, including the accumulation of water formed in the main reaction, the formation of sulphuric and sulphonic esters rendering the acid unavailable, and the actual destruction of the acid by reduction to sulphurous acid by the organic compounds present. Little or no experimental evidence is given in support of any of these hypotheses, and the present difference of opinion leaves the question still open.

With the assistance of Miss Lena Sutton the writer is attempting to get more definite information as to the actual limits of the reaction and their cause or causes. At the time of writing the work has not proceeded far enough to provide the solution of the problem, but it has already been learned that instead of the efficient limit being reached when the volume of the ether amounts to about six times that of the acid used there is no diminution of efficiency at about fifty times the volume, when ordinary commercial alcohol and acid are employed. It has been found, too, that the accumulation of water formed in the reaction cannot be the inhibiting factor, for it has been learned that it is practicable to start with highly diluted acid and obtain the usual results, the acid evidently becoming concentrated to the necessary degree by loss of water at the temperature ordinarily employed.

In order to determine the proportions of ether, alcohol and water in the successive distillates, they are submitted to fractional distillation, and the results compared with those from known mixtures in the proportions possible under the conditions of the experiment, assuming the alcohol used to have undergone the reaction with varying degrees of completeness.

It is hoped to obtain further experimental evidence bearing upon the problem during the present academic year.