The Depolymerization of Dextran in Non-aqueous Solutions

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It is previously known [1] that dextran is successively depolymerized in aqueous solutions in the presence of acids, enzymes or alkalies. The depolymerization by acids and by enzymes has the character of a hydrolysis. Methods have also been described for the depolymerization of dextran by heat and by ultrasound.

We have found that dextran can also be successively depolymerized by alcoholysis in organic solvents with free hydroxyl groups. The monovalent aliphatic alcohols are poor solvents for dextran. However, at temperatures above 140° C dextran dissolves rapidly in polyvalent alcohols, *e. g.* ethylene glycol, glycerol, or sorbitol. In such a solution dextran slowly reacts with the solvent, but the reaction proceeds more rapidly, if the solution is heated to a higher temperature (up to about 200° C) or if a small quantity (about 0.1 to 1 %) of an acid catalyst (phosphoric acid, trichloroacetic acid or acid sodium sulphate) is added. In the same way dextran reacts with phenols, *e. g.* resorcinol.

This type of reaction was first carried out with starch by Zulkowsky [2]. Berner found in his investigations on lichenin [3], inulin [4] and starch [5] that the depolymerization of polysaccharides in glycerol solution is an alcoholysis.

The depolymerization reaction can easily be followed by measuring the viscosity of samples taken out at intervals, as the intrinsic viscosity of dextran is approximately proportional to its average molecular weight [6].

By controlling temperature, catalyst and time in carrying out the alcoholysis, it is thus possible to obtain dextran glycosides with any desired average molecular weight.

The best way to isolate the reaction products from the solution is to add several volumes of water and then to precipitate them by adding a water-soluble organic liquid in which dextran is almost insoluble, *e. g.* ethyl alcohol or acetone. As the solubility of the dextran glycosides in this mixture decreases with increasing molecular weight of the reaction product and increasing amount of precipitating agent, it is possible to make a fractionated precipitation and thereby obtain preparations with different average molecular weights.

If a partial depolymerization of dextran is carried out in glycerol solution and the reaction product is subsequently fractionated to give a preparation with an average molecular weight of about 70 000, a product is obtained which has proved to be excellent for the manufacture of blood plasma substitute.

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Dehydropodophyllotoxin, a New Compound Isolated from *Podophyllum peltatum L.*

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In his first report on the isolation of α-peltatin from podophyllin Hartwell [1] described the substance as exhibiting a strong blue fluorescence in solution, contrary to podophyllotoxin, which was reported to be but weakly fluorescent. The statement was amended in a subsequent paper [2], and none of the natural lignan-derivatives so far isolated from *Podophyllum peltatum L.* is in fact fluorescent when sufficiently purified.

During a systematic reinvestigation of podophyllin by chromatography using sorbed formamide as a stationary phase and benzene as an eluent we noticed an intense blue fluorescence of certain fractions of the eluate between those containing podophyllotoxin and those containing α-peltatin.

Paper-chromatographic analysis of these and of other fractions by the method previously reported by us [3] revealed five,