70.8, and 69.8 (C-6), the presence of only six signals from carbon atoms showed the regular structure of the homopolymer and the absence of branches in the main chains. The position of the signals from the C-1 and C-6 atoms on the ppm scale indicated the β-(1→6)-linkage of the glucose units [6]. Hydrolysis of the polysaccharide under standard conditions confirmed the presence of glucose, alone. The molecular mass of the glucan was polydisperse.

On gel chromatography on a column of Sephadex G-50 in DMSO calibrated with dextrans T-20000, T-10000, and the linear polysaccharide laminarin ($\tilde{M}n$ 5000), a molecular-mass distribution curve ranging from 5000 to 10,000 Da was obtained.

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INFLUENCE OF AMMONIUM CITRATE ON THE INTRINSIC VISCOSITY OF A PECTIN SOLUTION

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Pectin is a water-soluble substance. However, sometimes the pectin obtained in the course of the development of conditions for its isolation from new sources is sparingly soluble or becomes insoluble in water although the process of its isolation is, as a rule, carried out from aqueous solutions. In general, the reasons for this phenomenon are known [1, 2], but in each concrete case it is necessary to know with what it is connected. This requires a study of a complex of such physicochemical indices of pectin as the amount of the main substance, the molecular mass, the content of esterified (methoxylated) carboxy groups and acetylated hydroxy groups, the amount of polyvalent cations, etc., which may all determine its passage into solution. The poor solubility of pectin does not permit this reverse connection to be made. Nevertheless, there is information that ammonium citrate forms a readily soluble complex with pectin [3]. Our results, obtained on samples of cotton pectin having a low solubility have shown that a solution of monoammonium citrate in a concentration of 0.5-1.0% is a good solvent for such pectins. Here it is necessary to take into account the possible influence of the ammonium citrate itself on the physicochemical indices of pectin.

The main physicochemical indices of pectin, apart from its molecular mass, are determined under the conditions of the specific action of the reagents used on the pectin macromolecule or on its degradation products [1, 2], and therefore the question of the possible influence of ammonium citrate is eliminated here. In the determination of the molecular mass, however, this influence is possible in view of the formation of a complex of pectin with ammonium citrate.

Citrus pectin of British production was used. The molecular mass was determined from the results of the viscometric method on the basis of the Mark-Houwink equation

$$[\eta] = K \cdot M^{a},$$

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where $[\eta]$ is the intrinsic viscosity, and K and α are constants for a concrete polymer-solvent pair. For a solution of pectin in 1% NaCl solution, according to the literature [4], $K = 1/1 \cdot 10^{-5}$, and $\alpha = 1.22$.

The viscometric measurements were carried out at 293 K in a Ostwald viscometer with a capillary having a diameter of 0.82 mm and a length of 83 mm and a measuring bulb with a volume of ~3 ml. The time of flow of a 1% solution of NaCl at a volume of 5 ml was 31.5 s. The concentration of the working solution of pectin was determined by drying in a clock glass 2 g of the sample to constant weight at 373 K. The other pectin solutions were prepared by isoelectric dilution of the working solution. Monoammonium citrate (ch.d.a. ["pure for analysis"]) was added to the prepared pectin solutions.

The intrinsic viscosity of the pectin solution determined viscometrically was 2.0. In the presence of ammonium citrate, this index fell to 1.9 for concentrations of 0.25 and 0.50%, and to 1.8 for a concentration of 1.00%. Consequently, the presence of ammonium citrate lowers the intrinsic viscosity of a pectin solution. In actual fact, the reduced viscosities of pectin solutions with increasing amounts of ammonium citrate were lower in all cases than that of the pectin solution without the additive. For example, the reduced viscosity of a pectin solution for limiting concentrations of 0.083 and 0.52% containing 0, 0.25, 0.50, and 1.00% of ammonium citrate were 2.45, 2.34, 2.29, and 2.05, and 5.10, 4.73, 4.36, and 4.17, respectively. This characteristic feature was retained for other types of pectins: beet (Krasnodarsk pectin factory) and apple (Varnitsa APO [Agricultural-Industrial Association], Bendery).

No clear difference was observed in the intrinsic viscosities of solutions containing 0.25 and 0.50% of ammonium citrate, since the resulting lowering of $[\eta]$ by 5% was comparable with the accuracy of the determination of the intrinsic viscosity by the graphical method. Values of $[\eta]$ of 1.8 and 2.0 correspond to molecular masses for the pectin of 19,000 and 20,500.

Thus, use of a solution of monoammonium citrate with a concentration of 0.5-1.0% as a solvent for pectin does not appreciably change its molecular mass determined by the viscometric method.

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