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Actual Problems of the Chemistry of Natural Compounds

ABSTRACTS

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POLYSACCHARIDES FROM SEEDS OF *Glycine max*

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Soybean- *Glycine max* -is an annual plant belonging to the family of leguminous crops. Soybeans play an important role in the preparation of food, fodder and soil fertility.

The purpose of this work is to isolate the complex of carbohydrates from the aerial part of *Glycine max*, collected during the ripening period of the seeds from Samarkand region, to determine its physico-chemical properties and monosaccharide composition.

To do this, air-dry raw materials were crushed and treated with ethanol to remove low molecular weight compounds. The alcohol extract revealed the presence of glucose, fructose and sucrose. To extract the polysaccharides, the plant residue was successively extracted with water, oxalate buffer, and KOH. As a result, water-soluble polysaccharides (WSPS) were isolated from the aqueous extract, pectin substances (PS) from the oxalate extract, and hemicellulose (HMC) from alkaline extract with yields of 2.75; 0.25; 15.45% respectively.

Water-soluble polysaccharides are white amorphous powder, highly soluble in water. The monosaccharide composition is represented by galactose, glucose, arabinose, rhamnose and uronic acid. The IR spectrum of WSPS contains absorption bands characteristic of polysaccharides: ν_{max}, 3259, 1608, 1401, 1275, 846, 750 sm^{-1}.

After the separation of WSPS from the meal with a mixture of equal volumes of 0.5% solutions of oxalic acid and ammonium oxalate at 70°C, PS was extracted. PS-amorphous powder of beige color, dissolves well in water, forming a thick solution with a relative viscosity of 7.14. Galactose, arabinose and uronic acid were identified in PS hydrolyzate.

Titrimetric analysis established that the content of free carboxyl groups (K_f) in PS is 2.7%; esterified carboxyl groups (C_e) – 4.05%; the degree of esterification (D_e) is 60%. Therefore, PS is a highly esterified pectin.

The IR spectrum has characteristic absorption bands for carboxypolysaccharides: ν_{max}, 3268, 1740 (C=O), 1631, 1554, 1370 sm^{-1}.

After extracting PS with 5% KOH solution, hemicellulose (HMC) was isolated with a yield of 15.45%.

Thus, the presence of alcohol-soluble sugars, water-soluble polysaccharides, pectin substances and hemicelluloses in the aerial part of *Glycine max* has been shown. Their monosaccharide composition was established and IR spectra were studied.