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of Academician Sabir Yunusovich Yunusov

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TASHKENT

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STUDY OF MORPHOLOGICAL CHANGES IN RICE STARCH DURING OXIDATION PROCESS WITH SODIUM HYPOCHLORITE

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The relevance of the search for new ways of chemical and physical modification of starch in order to improve the technological properties and reduce the consumption of raw materials is due to the wide use of this natural polysaccharide in various industries. The efficiency of starch and its derivatives using in industry differs from many factors, and in particular, the state of starch granules, fractional composition, their molecular weight and solubility, the presence of non-carbohydrate impurities that change during chemical processing. In this connection researches on studying of there have been carried out and we have studied morphological changing of granules of rice starch in oxidation by NaClO which produce by OAO «Navoiazot».

The morphological characteristics of the starch samples were observed using a JSM-6390 scanning electron microscope (NTC, Japan) at 15 kV. The results show that the very noticeable and serious damage to starch grains doesn't occur during process used in the experiment (Fig. 1).

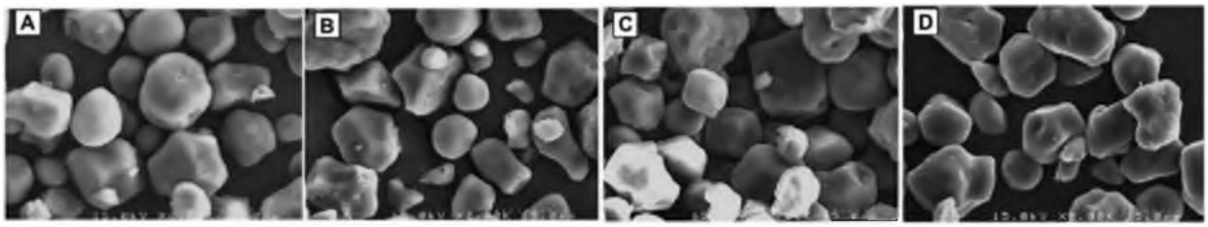

Fig.1. Electron micrographs of granules of native (A) and oxidized (B–D) rice starch (c = 40%) (with the introduction of quantity of the C(NaClO) – 0.01% (B – in 30°C), 0.015% (C – in 35°C) and 0.02% (D – in 45°C) to dry weight of the starch, medium pH=8-9, was adjusting by NaOH)

The granules of the oxidized starches were more delicate in appearance, which is probably due to the lower viscosity and hence the low molecular weight of the oxidized starches. Micrograph analysis of oxidized starches does not explain differences in digestibility.

The activating effect of the oxidizing agent is confirmed by microscopic observations, it can be seen that as the concentration of the oxidizing agent in the solution and the temperature of the reaction mixture increase, the starch grains undergo more and more changes, they gradually lose their spherical shape, depressions, folds, and breaks appear, also develop in them.

The obtained micrographs of samples of oxidized starch make it possible to detect changes on the surface of the starch granules, which cannot be avoided in any modification process with potentially strong oxidizing agents such as NaClO.