

# "Nanochemistry and biotechnology"

## The influence of colloidal solutions on the basis of aluminium on clearing of sugar manufacture products

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The aim of the work was to estimate possibility of additional reagents use in the process of diffusion juice preliminary defecation. As an additional reagent was applied suspension of high viscosity with use of aluminium nanoparticles as precursor. At the first stage aluminium nanopowder was received by joint sedimentation from a steam phase of metal and alkaline metal halogenide (NaCl) [1, 2]. Such encapsulation of metal particles in chemically inert matrix, on the one hand, limits them on the size, and with another – provides protective cover formation on their surface, that not only prevents processes of particles consolidation at storage, but also protects them from interaction with environment. Further for long-term nanoaluminium stabilization in colloidal solution shape the method of these powders dispersion in PEG composition, developed by authors, was applied [3]. As, as well as any colloid, the given system under the external factors influence or time will aspire to agglomeration, for the purpose of such phenomenon prevention at last stage of reception fast cooling colloidal solution – receiving thus colloidal solution with high viscosity was applied.

At the second stage as object of research was used diffusion juice, received in laboratory conditions by extraction by water from beet slices. In received juice the basic indicators of its quality were defined: the content of solids, sucrose, its cleanliness (a ratio of sucrose content to solids content, in %) were counted. Also the content of albumins and pectines was defined (as basic components of diffusion juice colloidal fractions). Traditionally, as the basic reagent for carrying out of preliminary liming process was used lime milk with density 1,18 g/sm<sup>3</sup>, prepared by liming of quick lime by hot water [4].

During experiments the efficiency of preparations containing aluminium in nanoform on degree of colloidal dispersion substances removal in the process of diffusion juice clearing in beet-sugar manufacture and increase of its quality is

shown. However, the received results show, that, depending on a way of reception, investigated additional reagents with aluminium nanoparticles have various efficiency on diffusion juice cleanliness change in the process of its processing by lime milk.

1. Patent Ukraini #2448 Sposob polucheniya inkapsulirovannih nanoporoshkov I ustanovka dlya ee realizacii / *Ustinov A.I., Melnichenko T.V., Liapina K.V., Chaplyuk V.I.* — Opubl. 10.04.2008, Bul.№7 (in Ukraine).

2. US 8491972B2 Method of producing encapsulated nanopowders and installation for its implement Ustinov A.I., Melnichenko T.V., Liapina K.V., Chaplyuk V.I., 23.07.2013.

3. Patent Ukraini #91374 Sposob dispergirovaniya I stabilizacii nanochastic medi v vodnih sredah / *Dulnev P.G., Liapina K.V., Davidova O.E., Ustinov A.I.* — Opubl. 10.07.2014, Bul.№13 (in Ukraine).

4. *Reva L.P., Pushanko N.N., Zamura S.A.* Ispolzovanie aktivnoj kremnievoj kisloti dlya dopolnitelnoj ochistki diffuzionnogo soka //Cukor Ukraini.- 2008. - N3. - P. 11-16.