APPLIANCE OF HYDRODYNAMIC TREATMENT FOR ACTIVATION OF THE HYDRATED LIME SLURRY

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The purpose. Investigation of the influence of the hydrodynamic treatment application for activation of the hydrated lime slurry during the purification processes of the sugar beet raw juice in the sugar production from sugar beets.

Results. The process for refining sugar beets consists of the dependable operations: washing, crushing, extraction, liming, carbonation, filtering, and addition of sulphur dioxide, concentrating, crystallizing and drying. Carbonation is the process in which remove impurities from the sugar solution of the sugar beet raw juice. The juice is purified using lime and carbonic acid.

In this scientific work general scientific methods, special methods, volume parametric imitation and visualization modelling methods, mathematical modelling methods, optical microscopy, and ionometry were used for the researches. Experimental investigations of liquid samples which were received with the application of the hydrodynamic treatment and control liquid samples were carried out with using standard laboratory measurement procedure and standard methodology.

It is established that application of hydrodynamic treatment for activation of the hydrated lime slurry during the production of sugar from sugar beets is very perspective.

By the volume three-dimensional parametric imitation modelling, visualization processes, mathematical and numerical modelling was found that the value of the linear speeds of a stream should be within 20-25 m/s. The research studies demonstrated the increasing of the potential of hydrogen of the water prepared for the technology of the activating hydrated lime slurry for the processes of juice purification. During the activating of the hydrated lime slurry in the purification processes of the sugar beet raw juice the consumption of the raw lime is decrease within 15%.

In general case was established that the decreasing of reduction-oxidation reaction which obtained throughout processing on an extent 200 s, after that there is not large decreasing of the reduction-oxidation reaction.

The obtained data verify, that the lowest rank of reduction-oxidation reaction was observed in water which has been processed with application of the hydrodynamic treatment. The common stage of decrease of reduction-oxidation reaction in evaluation with the initial makes 65%.

Conclusions. It was found that the application of hydrodynamic treatment for activation of the hydrated lime slurry in the technological processes of purifying sugar beet raw juice can greatly increase the capacity and replace the batch process for the continuous, can greatly reduce the duration of the process of activating mode, reduce power consumption.