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## Optimization of calculation of the crude juice saturator

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The main task of purifying crude juice by lime and kiln gas is to eliminate various non-sugar components to the maximum and to obtain deposits with high sedimentation and filtration rates.

Technological patterns of cold and heat treatment of hot crude juice that became the most prevalent in industrial practice, include predefecation as well as combined cold or mild hot primary defecation.

Thus, high quality of intermediate products is achieved due to the presence of cold (warm) stage of primary defecation, which leads to the increase of lime solubility under temperature decrease of sugar containing solution, accompanied by the dissolution reaction of reducing substances towards the formation of little colored substances. The latter being well absorbed in the process of I saturation, where the intense decomposition of chromophoric systems and dye molecules with a simultaneous decrease of colouration takes place, while heating of cold crude juice, as a result of reduction of lime solubility, is accompanied by the formation of a supersaturated sugar lime liquid, which under further saturation undergoes the gel phase, possessing high absorption properties.

Promising ways of refining crude juice both in terms of the maximum effect for purifying and forming good filtration sedimentation properties of deposit are referred to the separation schemes of bulk coagulates from non-sugar components prior to primary defecation. An improved treatment is based on the exclusion of deposit dissolution in the process of primary defecation and improved efficiency of I saturation on the pure deposit of calcium carbonate.

At sugar plants it is recommended to put into a widespread practice the scheme of crude juice defecation with progressive pre-defecation, combined primary defecation, defecation before the second saturation phase with recirculation of condensed suspension of II saturation along with the part of unfiltered juice of the I saturation for pre-defecation.

The Chair of Informatics (NUFT, Kiev) has done work on optimization of calculation process for the equipment intended for the absorption of carbon dioxide with the aim to neutralize calcium hydroxide when purifying crude juice in sugar production.

For this purpose there was developed a mathematical model to calculate the process of carbonation. The first saturation involving calcium carbonate completes the formation of deposit with the required for its isolation sedimentation and filtration properties.

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