

**EXERGY LOSSES IN SUGAR PRODUCTION**  
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It was considered a typical technological scheme of a sugar production factory with a capacity of 3000 tons/day, and determined the corresponding exergy characteristics.

In the initial preparing of product, the greatest loss of exergy (187 kW) falls on the process of obtaining affinity sugar with a minimum value of the degree of thermodynamic perfection 0.5. This is due to dissipative losses of centrifugation processes, mechanical separation and grinding, diffusion, in which energy is used on the equipment drives.

In the processes of syrups heating the exergy losses caused to heat transfer irreversibility at sufficiently high temperature differences, and the dissipative losses of the product transportation process in the subsequent processing steps. The largest losses of exergy (93 kW) fall on the process of heating the syrup of affinity sugar at a low value of the degree of thermodynamic perfection 0.77.

For syrup evaporation the greatest exergy loss (kW 1451) occur in the process of primary refined (as well as a low value of 0.55 degree thermodynamic perfection), which results to a large heat flows and an irreversibly of heat transfer processes at high temperature differences.

In the processes of collecting syrups, loss of exergy caused by dissipation in transportation of the product from several locations with subsequent mixing and direct losses of a heat to the environment from the equipment due to imperfect thermal isolation. The largest losses of exergy (10 kW) fall on the process of collecting the syrup 2 product at a sufficiently high value of the degree of thermodynamic perfection 0.92.

During filtration, the greatest loss of exergy (30 kW) falls on the process of filtering the syrup before sulphation at a sufficiently high value of the degree of thermodynamic perfection 0.89. This is due to the dissipative processes during filtration and the low quality of filtration material.

As follows from the consideration of the results for system of sugar production as a whole, the greatest exergetic losses are observed during the process of syrup evaporation (more than 70 % of the exergetic losses of the whole process of sugar production). These processes are also characterized by the lowest degree of thermodynamic perfection from all the processes under consideration (0.54), therefore, for these processes have been given the most attention.