INTENSIFICATION OF HEAT AND MASS TRANSFER IN THE TECHNOLOGIES OF DRYING ORGANIC MATERIALS COMBINED WITH SIMULTANEOUS DISPERSION IN ROTARY APPARATUSES

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Purpose of exploration. Justification of the choice of the method of combined drying and grinding processes in a cell with a mechanical rotor during processing of high-heat-sensitive materials.

Results. Literature review and analysis showed the prospect of application systems that operate with simultaneous drying and grinding in one working chamber. They are large areas of heat and mass transfer is increased as compared for example with a drum set specific productivity, reduced capital costs and energy consumption for the evaporation of moisture.

The results of experimental studies with changes in moisture content and temperature of the coolant along the length of the working chamber installation at various modes of drying heat-labile materials (chicken manure).

The author experiment brought the possibility of reaching the next thermal variables: initial coolant temperature within 600 – 800 °C; heat transfer coefficient in the range 900 – 1200 W/(m^2•deg); the average amount of heat for vaporization of moisture within the 3500 – 4000 kJ/kg of evaporated water; medium voltage chamber of the evaporated moisture 350 – 400 kg/(m^3 • hour).

The result of the processing and synthesis of the results was the development of a technique of engineering calculation of the installation, select equipment for forming production line of complex fertilizers based on chicken manure.

Conclusions. 1. Author experimentally proved that the grinding elements on the small size, which is organized in the same cell allows artificially maintain the temperature of the surface of the material close to the wet bulb temperature, thus reducing finding material in the second period to a minimum.

2. These tentative thermodynamic indicators point to the prospect of the use of cameras simultaneously drying and grinding in the processing of heat-sensitive materials.

3. The results of the author's work can be used in the design of energy efficient drying equipment for the production lines for processing organic heat-sensitive materials.