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Summary of doctoral dissertation "*The technology for production of multicomponent granulated fertilizers of NP and NPK type*".

The main purpose of this thesis was the development of a new continuous method for production of multicomponent granulated fertilizers of urea superphosphate type and products on its basis. The new method enables the use of phosphorite raw materials from different sources in a production process and provides higher quality of products and lower safety risk in comparison with batch method for production of above mentioned products described in the literature.

The additional purpose of the thesis was the determination of the possibility of reducing the water content in tested pulps (superphosphate pulps and urea superphosphate pulp) at the preparation stage and at the same time providing the appropriate transport and granulating properties. The findings of this research can be used for improvement of production processes of phosphoric and multicomponent fertilizers based on pulps (slurries) produced using phosphate raw materials containing calcium phosphates, and implemented in domestic plants.

The scope of the work included research on production of urea superphosphate type fertilizers (USP) and also multicomponent fertilizers based on USP. The course of possible chemical reactions in the analysed raw materials system and process parameters limiting the course of side reactions were determined during the research. The research was conducted in laboratory scale and semi-technical scale.

Taking into consideration the criteria for implementing of technological solutions, the developed solution should be classified as product and process innovations. The research carried out within the OECD doctoral dissertation program, was started at the TRL-2 level, i.e. from the formulation of the technological concept and continued until the TRL-7 level was reached, to demonstrate the operation of the technology prototype under operating conditions.

The implementation effect of this work is a technological concept of continuous production of urea superphosphate with a capacity of 20 tons/hour (with preliminary selection of equipments), which technological reality has been verified on a semi-technical demonstration plant operating continuously.