

*The completed scientific and research work № 2981-F “Investigation of Processes in Multilayer Composites for Waste Management Formation Aimed at Environmental Protection” – Research Advisor Ja.M. Kornienko.*

In 2009, principles of multilayer solid composites formation process with established properties have been theoretically proved. Physical and mathematical models of humic-mineral composites using the fractals theory have been introduced for the first time. A computer model of cluster diffusion has been created. The mathematical models for the formation of multilayer humic-mineral composites of solid base in a number of dispersed multiphase systems have been designed. Comprehensive experimental investigations on kinetics of a continuous process of multilayer solid composites formation have been conducted as well as an efficient area of its energy implementation has been identified. Physical and mechanical properties, chemical composition and thermal properties of multilayer solid humic-mineral composites have been defined. A constructive and technological concept of the vehicle for obtaining multilayer solid composites and method of calculation of such devices have been introduced.

*The results of the theoretical and research work have been implemented in the educational process of teaching such special courses as “Physical and Chemical Bases for Environmental Safety of Chemical Production” — “The Mass-exchange Recycling Industry” chapter; “Environmental Aspects of Chemical Production Processes” – “Creating Innovative Environmentally Sound Production” chapter and other chapters useful to prepare laboratory works: “Study of the Granulation Composite Solutions Process”, and “The Study of the Cyclone Apparatus Operation”.*

The suggestions regarding the possible introduction of technology to produce granular organic fertilizer from liquid waste containing nutrients has been made.

During the year of paper defence on the basis of the conducted work a monograph and a course book have been published, Doctoral thesis and 2 PhD theses have been defended (2 others are prepared to defend), 20 articles have been published, 30 presentations have been made at conferences, including 10 at international ones, 2 patents have been received. 20 students have been involved in the research work. According to the research results students have defended 5 master's thesis and 10 diploma projects.

Be sure to get the following information: about research results introduction in the educational process, and about applying the fundamental researches into applied developments, as for applied usage of research results it is necessary to study the information about the implementation or application in production.