Optimization of technology parameters and energy capacity of the RESS process

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Mathematical model of RESS process was generated including description of temperature, pressure, density and velocity fields in microcanal as well as in a free jet. The model contains differential governing equations of mass, impulse moment, energy and the Peng-Robinson equation of state. The system of differential equations is solved by means of Runge-Koot method of the 4^{th} exponent part.

To realize physical and mathematical connected modeling in order to obtain adjustable parameters of semiempirical mathematical model for optimization the technology parameters and energy capacity of the RESS process, experimental installation was constructed on the basis syringe pump. Experimental installation allows to obtain submicron particles at the system pressure up to 40 MPa, with the saturator temperature range up to 373 K, and the expansion device temperature up to 573 K. Ratio of length (L) and diameter (D) of the expansion device can vary in the range of 8-1000.

Suggested method of physical and mathematical connected modeling was tested in this piece of work the example of submicron particles of anthracene. Experimentally observed particle size distribution and morphology corresponds with the data deduced from the mathematical model.