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Computer Simulation Model of Charged Nanoparticles Clustering and Powder Deposition GALINA ZMIEVSKAYA, ANNA BONDAREVA, M.V. Keldysh Institute of Applied Mathematics RAS, 125047, Miusskaya sq. 4, Moscow, Russia — A new technology has been introduced for creation of materials and structures with special properties. The formation of nanoparticles in plasmas, the charging of nanoparticles and the first order phase transition leading to crystal formation are investigated by simulation stochastic simulation methods /SSM/. It has been applied to study of the silicon carbide 3C -polytypic model formation. SiC experimental producing has attracted considerable attention. The feasibilities of both: SSM on the base of stochastic differential equations/SDE/ and dusty plasma 3D3V kinetic object-oriented code allows to study non-equilibrium stage of charged particles clusterization in plasma and crystal powder formation as an adjunct to other methods of experiments interpretation. We assume that formation of charged clusters and evolution of their size (clustering) is to be described by kinetic distribution function /DF/ versus sizes. Here we refuse from both: idealized thermodynamics concept of phase transition as well as the Sleiozov-Lifshits exponential factor of forming a nucleus rate from classical nucleation theory. Powder of *3C-SiC* DFs are non stationary, which depend on follows: Charging of melted droplets, its stoichiometric state, neutralization and coagulation on the substrate, model jump of temperature etc.

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