

3D MONTE CARLO SIMULATION OF PHASE SEPARATION IN A BINARY ALLOY

A.S. Shirinyan, Yu.S. Belogorodsky

B. Khmelnytskyi Cherkasy National University,
Faculty of Physics
(81, Shevchenko Str., Cherkasy 18031, Ukraine;
e-mail: shirinyan@phys.cdu.edu.ua)

S u m m a r y

The kinetics of new phase nucleation in a binary alloy with the fcc crystal lattice has been analyzed in detail making use of the three-dimensional Monte Carlo simulation. The dependences of various parameters of the process — the average dimension of new-phase particles, number and volume of new-phase clusters, distribution function of particles over their dimensions, dispersion, and supersaturation — on time and the parameters of the system have been calculated. The approximation proposed considerably improves our understanding of the mechanisms of nucleation and growth of the new-phase particles in a metastable nanosystem.