PORE EVOLUTION AT REACTIVE DIFFUSION IN SPHERICAL AND CYLINDRICAL NANOPARTICLES

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S u m m a r y

A phenomenological model has been proposed for the description of the pore evolution at the phase formation in spherically and cylindrically symmetric binary systems "core–shell" with different mobilities of components. The dependences of the duration and the efficiency of the pore formation, relative pore stability, and degree of core restoration in the course of pore shrinkage on the initial dimensions of the system, surface tension, thermodynamic gain of formation/decay of a compound, and diffusion mobilities of components are analyzed. The ratio between the thermodynamic reaction gain and the surface tension is shown to be the governing parameter at the transition from the stage of nanoshell formation to that of its shrinkage; namely, it determines which of the regimes–pore formation and shrinkage with or without restoration of the initial components – will take place.