SURFACE SEGREGATION AT THE (111) AND (100) CRYSTAL FACES IN THIN FILMS OF METAL BINARY ALLOYS $A_{1-x}B_x$

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S u m m a r y

The effect of multi-layer surface segregation in thin films of metal binary alloys $A_{1-x}B_x$ has been studied in the framework of the regular solid solution model. The segregation composition profiles at their (111) and (100) crystal faces contacting with vacuum were calculated for finite-thickness slabs, with two outmost atomic layers being taken into account. The segregation composition profiles were established to differ substantially for the solutions ordered, perfect, and prone to the decay. A special attention was given to studying the depth concentration profiles in the slab, which arise within the temperature range below some critical temperature of decay or ordering. The internal interface between two phases with the excess of either A or B component, respectively, has been shown to emerge in the slabs of decaying solid solutions. In the ordering solid solutions, the effect of alternating-sign segregation is observed, when all the odd layers of the slab have an excess of one component, and all the even ones of the other. It has been found that, for the slabs with the outer surfaces with the (100) orientation, the effect of alternating-sign segregation transforms into the effect of atomic ordering, and, in the temperature range below the ordering temperature, there appear the nondamping depth oscillation concentration profiles into the slab.