TRACER DIFFUSIONMECHANISM IN AMORPHOUS SOLIDS

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TÓM TẮT:

Tracer diffusion in amorphous solid is studied bymean of nB-bubble statistic. The nB-bubble is defined as a group of atoms around a spherical void and large bubble that represents a structural defect which could be eliminated under thermal annealing. It was found that amorphous alloys such as CoxB100–x (x = 90, 81.5 and 70) and Fe80P20 suffer from a large number of vacancy bubbles which function like diffusion vehicle. The concentration of vacancy bubble weakly depends on temperature, but essentially on the relaxation degree of considered sample. The diffusion coefficient estimated for proposed mechanism via vacancy bubbles is in a reasonable agreement with experiment for actual amorphous alloys. The relaxation effect for tracer diffusion in amorphous alloys is interpreted by the elimination of vacancy bubbles under thermal annealing.