

Effect of the Interstitial Cluster on the Lattice Expansion of Irradiated Metals*

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Abstract

Lattice parameter and length change were formulated as a function of irradiation dose on the hypothesis that an interstitial ceases to cause the lattice parameter change after interstitial clusters grow up to a certain size, whereas the interstitial still contributes to macroscopic volume change by one atomic volume.

The resultant formula was applied to the experimental results obtained by Kissinger et al. and Gray and Cummings on the lattice parameter and volume change in neutron irradiated Mo.

The hypothesis is found to be capable of explaining several features of the experimental results in a consistent manner. The nature of stage III defects in Mo was also discussed in conjunction with the experimental results.

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