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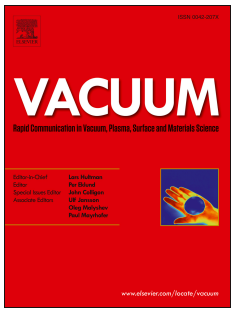

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A modified Avrami equation for kinetics of static recrystallization of Nb-V microalloyed steel: Experiments and numerical simulation

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Abstract:

Static recrystallization behavior of Nb-V microalloyed steel was investigated by experiments and numerical simulation method. A series of two-stage hot compression tests were performed on Gleeble 1500. Based on the tested flow stress curves, the conventional kinetics model of SRX was established. It is found that there exists a large deviation between experimental SRX fraction and predicted ones. Then, according to the analysis of SRX characteristics of the tested steel, a modified Avrami model was proposed. The comparison result shows that the modified model can accurately describe the SRX fraction. In addition, the SRX behavior of the tested steel was simulated by finite element method (FEM). The effects of deformation parameters on SRX fraction were analyzed. And the simulation SRX fractions are verified by the experimental and calculated ones.

Key words:

Static recrystallization; kinetics model; Avrami model; microalloyed steel; FEM

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