

Off-eutectic growth model for solidifying alloy from undercooled state

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Abstract

The classical eutectic growth models are based on the use of eutectic composition. These models neglect the effect of the primary phase formation and their direct using in the rapid solidification process of off-eutectic (hypoeutectic and hypereutectic) alloys is absent. Combining the effect of the primary phase in the eutectic transformation and an off-eutectic composition, the solidification growth model is derived in the present work. The effect of the model and materials parameters on solidification kinetics is discussed in comparison with experimental data. Computational results on the off-eutectic growth model show that the model agrees well with experimental data on solidification kinetics of Ni-B and Ti-Si alloys.

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