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Numerical simulation on microstructure of ultralow carbon bainite in welding molten pool

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A new model for the microstructure of ultralow carbon bainite in welding molten pool during solidification process was developed, which was based on cellular automation method and realized the separation of solid solute concentration and liquid solute concentration. The single dendrite and multi-dendrite with different crystallographic orientations and columnar-to-equiaxed transition were simulated. The influence of different undercoolings on the morphology of dendrites was considered. The results indicate that the growth rate becomes faster and the microsegregation is more serious when the undercooling increases, while the needed time is shorter. At the same time, the crystallographic orientations affect the dendrite morphology, especially the growth of the secondary and tertiary dendrite trunks.

Biography

Zhang Min is a Professor in the School of Materials Science and Engineering, Xi'an University of Technology. He is currently working in the Shaanxi Key Laboratory of Electrical Materials and Infiltration Technology in the Xi'an University of Technology, China.

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