Poster Session | F. From Microstructure to Properties: Mechanisms, Microstructure, Manufacturing

[PO-F1]Poster Session 1

Symposium F

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# [P1-47]Phase-field Simulation of Solidification Process in Welding Pool of Fe-C Binary Alloy

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Abstract: In this paper, the phase field method was used to study the growth process of Fe-C binary alloy welding pool dendrite. In the phase field model, the characteristics of small volume, fast cooling rate, large temperature difference and high degree of superheat of the welding pool were considered. And base on the model, the influence of undercooling on the crystal morphology of the alloy was predicted. Firstly, the growth morphology of Fe-C alloy dendrites in welding pool was successfully simulated by using the phase field model. Meanwhile, The effects of C concentration distribution on dendrite growth morphology and dendritic spacing were further investigated. The simulation results are consistent with the melten pool solidification theory.

Keywords: Fe-C alloy;solidification of weld molten pool;phase field method; dendritic morphology