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“A Study of the Transition Kinetics from Para-Equilibrium to Ortho-Equilibrium^a”

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The kinetics of austenite decomposition to ferrite in an Fe-Mn-C ternary system have been calculated using computational thermodynamics and diffusion-controlled kinetics models and the results will be presented. The transformation was modeled by initially imposing a para-equilibrium condition at the austenite-ferrite interface followed by an ortho-equilibrium condition at the interface once para-equilibrium was achieved throughout the system. The initial ferrite formation was succeeded by transient ferrite dissolution once the ortho-equilibrium reaction was implemented. The predicted results can be easily explained by considering the nature of the elemental fluxes at the interface. Preliminary results from experiments designed to critically evaluate the predictions will also be presented.

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