

# Cahn-Hilliard/Allen-Cahn system with degenerate mobility

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## Abstract

We present a mathematical analysis to a Cahn-Hilliard/Allen-Cahn system with degenerate mobility that models an isothermal process of solidification of a binary alloy. This model is able to predict an observable phenomenon called solute trapping. The existence of global weak solutions for the system is proved. We approximate the degenerate system and show the convergence of solutions to the approximated non-degenerate problem to a solution of the degenerate one. We also investigated deeply the non-degenerate system by showing the existence of global weak solutions, the existence of global strong solutions in the two-dimensional case, and local strong solutions in the three-dimensional case, as well as, providing conditions to the uniqueness be satisfied.

Joint work with André Ferreira e Pereira (CEFET - MG, Belo Horizonte, Brazil)

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