Global Well-Posedness and Convergence of the Solutions of the Cahn-Hilliard Equation with Temperature

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We consider the Cahn-Hilliard Equation with dynamic boundary conditions in the non-isothermal case. We show that this problem which looks quasilinear is in fact semilinear. By means of maximal regularity in L_p we obtain well-posedness of the problem and energy estimates yields global bounds. By means of semigroup techniques the orbits of the solutions are shown to be relatively compact in the energy space. The Lojasiewicz-Simon inequality is shown to hold for the energy of the system, and is used to prove convergence of the solutions to steady states as time approaches infinity.