

VISCOUS CAHN–HILLIARD EQUATION WITH DIRICHLET BOUNDARY CONDITION

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Abstract. In this paper, we show the existence of solutions of the initial value problem for the viscous Cahn–Hilliard equation with the homogeneous Dirichlet boundary condition. In the previous researches, the existence of strong solutions is shown for the case where the Sobolev subcritical condition is imposed for the nonlinear term. We exclude this restriction by decomposing the nonlinear term into the difference between a maximal monotone term and a perturbation term, and prove the existence of the strong solutions to the initial boundary value problem of the viscous Cahn–Hilliard equation. Furthermore, some smoothing effect of the solutions is also discussed. Our proof relies on the abstract theory of the evolution equation governed by the subdifferential operator.

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