

77. Zvi Artstein and Marshall Slemrod, **Phase separation of the slightly viscous Cahn-Hilliard equation in the singular perturbation limit.** Indiana University Mathematics J. 47 (1998), 1147-1166.

Abstract. We prove the existence of cluster points in L^1 as $\varepsilon \rightarrow 0$, say \bar{u} , of solutions $\{u^\varepsilon\}$ to a Cahn-Hilliard equation on a domain $Q_T = \Omega \times (0, T)$, $\Omega \subset \mathbb{R}^N$, with $O(\varepsilon)$ viscous damping and finite energy initial data. The function \bar{u} is then in $BV(Q_T)$ and has values in $\{-1, +1\}$ for almost all $x, t \in Q_T$. Furthermore the two separated phases $Q_+(t) = \{x \in \Omega : \bar{u}(x, t) = +1\}$ and $Q_-(t) = \{x \in \Omega : \bar{u}(x, t) = -1\}$ are well defined and the perimeter of the interface $\partial Q_+(t) \cap \partial Q_-(t)$ is bounded. We examine also the limit behavior as $t \rightarrow \infty$ of the separated phases.

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