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Marianne Korten (marianne@math.ksu.edu), Department of Mathematics, Kansas State University, Manhattan, KS 66506, and **Charles Moore*** (cnmoore@math.ksu.edu), Department of Mathematics, Kansas State University, Manhattan, KS 66506. *On the two phase Stefan problem.*

We consider the two-phase Stefan problem $u_t = \Delta \alpha(u)$, where $\alpha(u) = (u - 1)$ for $u \geq 1$, $\alpha(u) = 0$ for $-1 \leq u \leq 1$, and $\alpha(u) = u + 1$ for $u \leq -1$. We discuss existence and uniqueness of solutions of the Cauchy problem, energy estimates and regularity of solutions. (Received February 07, 2006)