On the Behavior of the Test Ideal Under Separable

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The test ideal $\tau(R)$ is an important measure of singularities in positive characteristic commutative algebra. This invariant was first described as the set of test elements in the celebrated theory of tight closure pioneered by Hochster and Huneke. More recent interest, however, in test ideals largely stems from their connections to analytic invariants in complex algebraic geometry. The multiplier ideal $J(X; \Delta)$ of a Q-divisor Δ on a complex algebraic variety X is a fundamental object in the study of higher dimensional birational geometry. Surprisingly, after reduction to characteristic $p \gg 0$, the multiplier ideal and the test ideal coincide. Our main goal in this paper is explore and prove a transformation rule for the test ideal under finite morphisms in analogy with the transformation rules for multiplier ideals in characteristic zero. Time permitting, we will also discuss the problematic behavior of multiplier ideals under finite maps in positive characteristic.