Timo Salin: *Quenching and blowup problems for reaction diffusion equations*; Helsinki University of Technology Institute of Mathematics Research Reports A466 (2004).

Abstract: *In this thesis we study quenching and blowup problems for reaction diffusion equations with Cauchy-Dirichlet data. We give sufficient conditions for certain reaction terms under which quenching or blowup can occur. Furthermore we show that the set of quenching points is finite for certain nonlinearities. The main results concern the asymptotic behavior of the solution in a neighborhood of a quenching or blowup point. We prove two kinds of asymptotic theorems. First we study quenching or blowup rate results and then give precise asymptotic expressions for solutions in a backward space-time parabola near a quenching point for certain reaction terms.*

AMS subject classifications: 35K20, 35K55, 35K57, 35K60, 35B05, 35B40

Keywords: Reaction-diffusion equation, quenching, quenching set, quenching rate, asymptotic behavior of solutions, refined asymptotics, blow-up, blow-up set, blow-up rate

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