1033-35-39   **David Hoff*** (`hoff@indiana.edu`), Department of Mathematics, Rawles Hall, Indiana University, Blooomington, IN, and **Gui-Qiang Chen** and **Konstantina Trivisa**. *Asymptotic behavior of solutions to a model for the combustion of a compressible, reacting fluid.*

We study the time-asymptotic behavior of solutions to a model describing the dynamic combustion of a viscous, compressible, exothermically reacting fluid. Initial conditions are quite general and the burned and unburned fluids may have different equations of state. We construct an entropy functional whose spatial integral is monotone in time and from this we derive a number of a priori bounds which are independent of time. We show that the solution tends to a steady–state as time goes to infinity and we establish necessary conditions and sufficient conditions on the total initial energy guaranteeing that this steady–state represents complete combustion of the fluid. (Received August 21, 2007)