Public Abstract

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Title:ANALYSIS OF THE DYNAMICS OF THE SYSTEM OF NONLINEAR DIFFERENTIAL EQUATIONS DESCRIBING A TUBULAR REACTOR

A characterization of the solution(s) of nonlinear boundary value problems (BVPs) arising from a class of chemical reactions occurring in a adiabatic tubular reactor when the mass and thermal Peclet numbers are different is performed. Results show that for large Peclet numbers and activation energy, and for sufficiently small Damkohler number and reactor length, the solution to the BVP is unique. While for small Peclet numbers and activation energy, and for large Damkohler number and reactor length, there exist at least three solutions to the BVP. The conclusion is that the number of solution (s) for the BVP depends on the choice of parameter values. Likewise, the first set of parameter values listed above models the adiabatic plug flow reactor, while the other parameter set models the adiabatic continuous stirred tank reactor.