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Abstract

A method to determine kinetics, diffusion and adsorption equilibrium parameters simultaneously in porous catalyst particles, where a first order chemical reaction occurs under diffusion control conditions in batch reactor, was proposed. The method is based on the use of observable magnitudes from a few experiments in a well stirred batch reactor. By means of a model considering the accumulation of reactant in the catalyst particles, the transient effectiveness factor allows analyzing the time response of systems with different adsorption capacities. The analysis basis and consequent methodology are more general and precise than those resulting from the conventional assumption, which consider that the concentration profiles in the particles, fulfill the steady state condition. Once an initial period elapsed after the reactant injection, the transient effectiveness factor reaches a pseudo-equilibrium state, condition under which an analytical expression can be used to describe the evolution of the reactant concentration in the fluid phase as a function of time. The parameters characterizing that

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