A = reactant
C = constant of integration
C_A = concentration of A
E_R = activation energy for reaction
E_D = activation energy for deactivation
F = augmented function
K_A = rate constant for reaction
K_{A0} = rate constant for deactivation reaction
K_D = rate constant for deactivation
K_{D0} = frequency factor for deactivation
r_A = rate of reaction of A
r_{12} = rate of reaction for $A \rightarrow R$
r_{23} = rate of reaction for $R \rightarrow S$
r_{13} = rate of reaction for $A \rightarrow S$
r_y = $(\partial r_A / \partial_y)$
R = gas constant
t = reaction or batch time
t_f = total reaction time
t_f^* = limit defined by Equation (10)
T = absolute temperature
X_A = conversion of A
y = dependent variable in Bolza problem
y_j = dependent variable in Bolza problem

Greek Letters

α, β = numerator, denominator, respectively of Equation (10)
δ = deactivation rate
λ_j = jth Lagrange multiplier
ϕ_j = jth constraint equation
ψ = objective function

Superscripts

l, k, m, n = powers, Equation (1)

Subscripts

f = final or end condition
i = index
0 = initial condition
y = partial derivative with respect to y
$-yy$ = second partial

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BOOKS

The Chemical Reactor Omnibook, Octave S. Levenspiel; Oregon State University Book Stores, 1979. 685 pages. $20.00 plus $1.75 mailing charge.

The Chemical Reactor Minibook, Octave S. Levenspiel; Oregon State University Book Stores, 1979. 226 pages. $7.00 plus $1.40 mailing charge.

These unique and imaginative companion volumes provide a concise compendium of useful results for a selected variety of chemical reactor design situations, and a large collection of problems (1382 in the Omnibook, 729 in the Minibook) which vary in difficulty and which should keep most undergraduate students very interested in learning more about the subject. The Omnibook is intended by the author to serve as "a reference book for methods in reactor design, a supplementary text for a course of study, or a basis for a self-paced or self-study course on the subject." It is divided into sections on single phase reactions, reactors with solid catalysts, catalytic reactors with two changing phases, gas/liquid and liquid/liquid reactions, reaction of solids, flow through reactors, and enzyme and microbial reactions. The emphasis is on the presentation of the important performance equations, guidelines, and relationships needed to solve practical and somewhat simplified problems in these areas, rather than on the derivation or detailed discussions found in most textbooks. While it succeeds very well in its stated goals, a reading of it alone may leave teachers of the subject feeling somewhat unfulfilled.

The Minibook is a condensed version of topics from the Omnibook, and is intended to supplement a standard text on the subject. Included are about 75% of the sections on single phase reactors, solid catalyst reactors, reactions of solids, and flow through reactors, and of course a reduced number of problems.

Professor Levenspiel's inimitable wit pervades these treatments and the associated problems, and makes for a delightful reading experience. He makes no claim to cover the wide range of topics that many texts attempt, and discussions of reaction mechanisms and the thermodynamics of chemical reactions are notably absent. An interesting production feature is that the authors handwritten copy has been directly reproduced, and consequent advantage of this has been taken to produce a concise and legible mixture of text, equations, and figures.

In summary, teachers and students of beginning and intermediate chemical reactor design should find either of these volumes extremely useful and stimulating, either as an associated teaching aid or as a valuable reference.

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