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## *Coupled, Nonlinear Mass Transfer and Heterogeneous Reaction in Porous Media*

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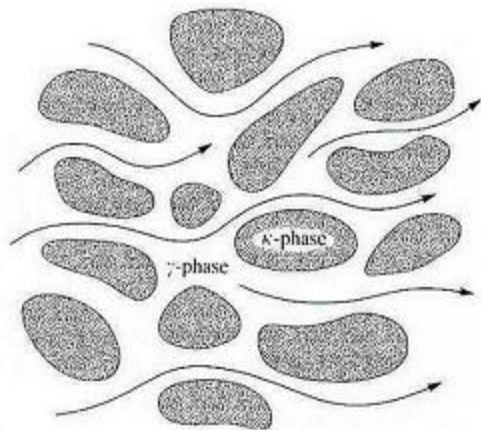
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### 1.1 Introduction

This chapter deals with multicomponent mass transfer and heterogeneous reaction under conditions where temperature effects can be ignored. The process is illustrated in Figure 1.1 where we have identified a flowing fluid as the  $\gamma$ -phase and an impermeable solid as the  $\kappa$ -phase. The chemical reaction takes place at the  $\gamma$ - $\kappa$  interface, and when convective transport is important this situation is often referred to as mass transfer with reaction at a nonporous catalyst. Such systems are commonly treated in texts on reactor design [1–4] and in many cases one must consider the effect of heat transfer on the reaction rate. When convective transport is negligible, the process illustrated in



**FIGURE 1.1**

Transport in a rigid porous medium.