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Capillary model of the biochemical process in three-phase reactor

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Tags:	biochemical process, three-phase reactor, diffusional flux, laminar flow

Abstract: In the capillary model randomly packed bed of the reactor is modeled as a set of parallel, straight capillary tubes, with dimensions in the range of millimeters. For such a geometry of the bed momentum balances of the fluid phases (gas and liquid) have been derived forming the basis for the estimation of velocity profiles and in consequence to determine the relationship between the film thickness of the gravitationally drained downward liquid and the process variables. This quantity was subsequently used in the evaluation of the effective porosity and specific surface area of the packing, parameters necessary in the balances of reagents. The set of partial differential equations constituting the mass balances of reagents in the phases determines the concentration profiles of these components and as a final result the biodegradation efficiency of the pollutant. The mass transport between the phases is realized only as a diffusional flux which is justified by the assumption of a laminar flow of the phases.

Attachments:

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