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The template parameters selection of the efficient utilisation of enzymatic membrane

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Abstract:

This study aims at formulating and analysing the model of an enzymatic layer located on a membrane surface. The transport of substrate inside a layer proceeds in two ways: by the substrate solution motion in pressure process and by counter-flow diffusion induced by a substrate concentration gradient. The model was verified positively in the process involving the lipase from *C. antarctica* for the case in which the membrane does not have the ability to retain the substrate ($R_S = 0$).

The enzymes, as very selective catalysts isolated from natural sources are usually the most expensive component of the system thus all their molecules included in a layer should be involved in the catalysis. The model could be useful in determining the process parameters to ensure that this condition is met.

The data gathered suggest that the most important parameter is the thickness of the catalytic layer. An increase in thickness causes a proportional increase of both the Pe and Da numbers. Their high values provide the high values of a substrate conversion degree. However, thick layers generate costs coming from the high mass of enzyme, thus this parameter should be particularly optimized. As a final conclusion, we proposed a template

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