

DESIGNING BIOLOGICAL REACTORS

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The growth of micro-organisms, product distribution, and therefore the purity of the final quality of the product is controlled by the growth environment which is in turn determined by the correct design of the biological reactor. Therefore great emphasis is paid to biological reactors of novel microbiological processes.

First different types of reactors are surveyed and then an attempt is made to to classify them based on their mode of operation. The importance of kinetic models and transport phenomena is discussed. The state-of-art of designing, problems encountered and scale-up aspects are reviewed.

A large percentage of industrial reactors belong to the non-stirred, non-aerated vessels in which the course of the process is determined by the true kinetics. Occasional heat transport problems are confined only to very large reactors. The problems posed by the non-stirred aerated bioreactors were overcome and are being used successfully. Stirred aerated bioreactors are used for production of high value products for which successful design and scale-up methods are available. Although continuous, small scale reactors are possible, large applications are limited.

The growth kinetics is influenced by several factors and the exact nature of the problem is poorly understood. Therefore the changes in the design of biological reactors are not so rapid.