MODELING HEAT TRANSFER DURING SOLID STATE FERMENTATION IN ROTATING DRUM BIOREACTOR: PARAMETER ESTIMATION

Heat transfer is the main problem in large scale solid state fermentation. Mathematical model of heat transfer in rotating drum bioreactor can be used as a tool to improve the understanding of heat transfer phenomena occurring in the bioreactor. This knowledge will lead to the better operation, design and control techniques. The models describing axial temperature profiles were developed. Groups of parameters including heat transfer coefficient from air to outside reactor, heat transfer coefficient from substrate to air, heat transfer coefficient from substrate to outside reactor and mass transfer coefficient of water between air and substrate were estimated. For growth and protease production of *Aspergillus oryzae* on tapioca and soybean pulp within 22.7 L rotating drum bioreactor with air at a superficial velocity of 0.01 m/s and rotational speed of 5 rpm, the model agrees reasonably well with the experimental results.