Conclusions

The kinetics of lipase-catalyzed glycerolysis reactions between triacylglycerol and glycerol were successfully modeled using rate expressions requiring adjustable parameters. Unlike previous reports in the literature, the present model is able to account for the effect of concentrations of all chemical species participating in glycerolysis reaction through at the entire reaction. The simulation results show that mostly glycerol reacts with fatty acid of triacylglycerol to produce monoacylglycerol in glycerolysis reaction. From a thermodynamic standpoint, a greater incorporation of glycerol is expected because a higher concentration of this acyl acceptor should shift the equilibrium toward greater glycerolysis reaction. Another important observation was that the behavior of high substrate concentrations shows high initial production rates but low yields of monoacylglycerol.