Kinetics & Reactor Design I: Kinetics

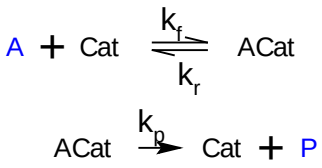
Continuing Ed workshop by Richard Skeirik,PE

Bio/Heterogeneous Reactions Exercise

Since simple bio reactions and heterogeneous reactions have the same reaction model, lets adopt some neutral nomenclature:

A – Reactant
Cat – the enzyme or the heterogeneous catalyst
P – Product

Then the reaction model would look like this:



Write the rate equation for each of A, ACat, and P

R(A) =

R(ACat) =

R(P) =

That wasn't so bad, was it? Now, what if the second reaction was really slow, so the first reaction comes to equilibrium. What forward and reverse rate can you say are equal. Write it out:

Now think about the catalyst. It never disappears. It exists as free Cat, or the ACat complex. Now (easy question), before we put in any A, we start with an amount of Cat we call Cat_0. Once we put in A, we have some Cat and some ACat. Write the simple sum that relates Cat and ACat to Cat_0