Question 2: Enzyme Kinetics

8.1. Using the law of mass action, write down four equations for the rate of changes of the four species, *E*, *S*, *ES*, and *P*.

Answer:

The law of mass action is a representation of the relationship between concentrations of the reactants and products in a chemical reaction.

Now let's see the equation for the law of mass action ,
aA +bB → cC + dD
here the A and B are reactants, C and D are products and a,b,c,d are coefficients
now lets do the rate of change equation .
Rate of change of E
D(E) /d(t) → -k1(ES) +k2(ES) + k3(P)
Rate of change of S
D(S)/dt → -k1(ES) + k2(ES)
Rate of change of ES
D(ES)/d(t) → k1[E][S] - k2[ES] – k3[ES]
Rate of change of P
D(P)/dt → k3[ES]

8.2. Range kutta method is a numerical method used to solve ordinary differential equations. It is widely used method due to its accuracy , this deals with h, the size, tn the current time .