

(Each problem must be completed on a separate page. All short answer questions must be typed. All math problems must show work.)

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1. If an enzyme enhances the rate of a particular enzymatic reaction by  $4.5 \times 10^{11}$  fold, what is the difference in the activation energies of the catalyzed and uncatalyzed reactions?
2. Use the following enzyme-catalyzed reaction data set to calculate the maximum velocity and the Michaelis constant of the enzyme using the Lineweaver-Burk equation, the Eadie-Hofstee equation, and least-squares curve fitting.

[S] (mM)	Vo (uM/min)
1	11
2	29
4	41
6	55
8	67
10	76
12	82
14	85
16	89
18	95
20	97

3. Derive a velocity equation for an ordered bisubstrate enzyme system using the rapid equilibrium assumption.