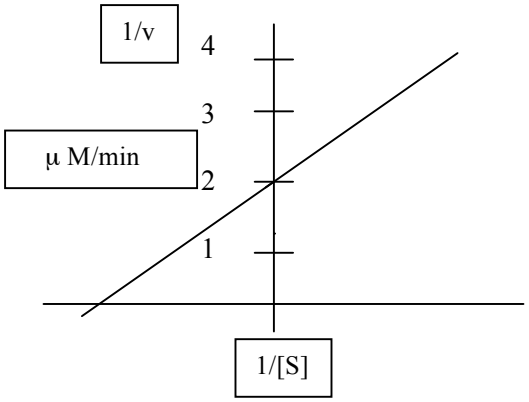
Worksheet #3

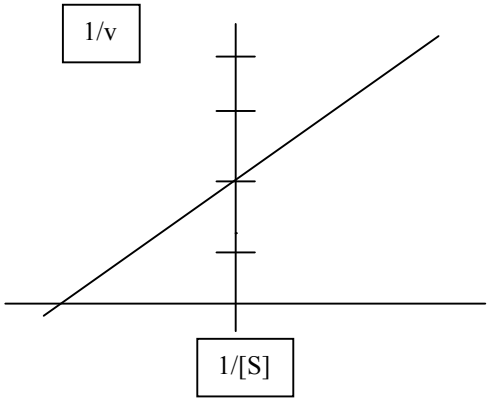
1. The reaction A → B is catalyzed by an enzyme that follows Michaelis-Menton kinetics. If the initial rate of the reaction is measured under conditions where [A] = $2/3K_m$, at what percentage of V_{max} will the velocity of the reaction be?

2. For the reaction above, when [A] = Km and the enzyme concentration is 3×10^{-8} M, the velocity of the reaction is 15 μM per min. At saturating [A], each molecule of enzyme can catalyze how many reactions in one minute?

3. The reaction S → P is catalyzed by an enzyme that follows Michaelis-Menton kinetics. From the following graph determine Kcat. [E] = 2×10^{-6} M



4. Draw a line on the following graph to demonstrate how a competitive inhibitor would affect the curve. Label clearly which line is with inhibitor.



5. Rhinoceros myoglobin has a P_{50} for O_2 of 40mmHg. What PO_2 is needed to saturate 60% of myoglobin?

6. Draw the oxygen binding curve of hemoglobin. Then draw in the two curves of hemoglobin if it is stuck at the T state and R state. Explain why and how hemoglobin achieve sigmoidal oxygen binding properties.

7.

A) . True/False. Only hemoglobin contains the heme group.

B) True/False. The structure of myoglobin prevents it from transporting oxygen like hemoglobin does.

C) True/False. The R-state of hemoglobin has higher oxygen affinity than the T-state

D) True/False. The activation energy, G‡, can be lowered by an enzyme.