

Take Home portion

You are free to use your textbook for help, however you may not ask any other student or any other instructor except Dr. Z for help. You are also allowed to use a computer, and, in fact you are strongly encouraged to use a spreadsheet program do do a graphical analysis of this data. If you like, you can submit your answer electronically by E-mailing your answer to me at michaelzehfus @ bhsu.edu

Take home question 1 (15 points).

Find K_m , V_{max} , K_{cat} , and the specificity constant for an enzyme from the following kinetic data. These experiments were all done with the enzyme concentration at $1 \mu\text{M}$.

[S] (M)	v_o (mol/min)
5×10^{-6}	6.1×10^{-4}
1×10^{-5}	9.5×10^{-4}
2×10^{-5}	1.4×10^{-3}
4×10^{-5}	2.05×10^{-3}
8×10^{-5}	2.35×10^{-3}

Take home question 2 (15 points).

The above experiments were tried a second time in the presence of lactic acid, a proposed inhibitor of this enzyme. When the lactate concentration was 0.5M , the following data was obtained:

[S] (M)	v_o (mol/min)
5×10^{-6}	5.0×10^{-4}
1×10^{-5}	7.4×10^{-4}
2×10^{-5}	1.01×10^{-3}
4×10^{-5}	1.19×10^{-3}
8×10^{-5}	1.34×10^{-3}

If these solutions are dialyzed to remove the lactate the enzyme kinetics return to that shown in problem 1.

Is lactate an inhibitor? If so, what kind of inhibitor? (Competitive, Suicide, uncompetitive, noncompetitive etc.) How does the inhibitor bind to the enzyme (permanently destroys active site, reversibly binds to active site, binds to some other site etc.)

While we didn't go over these equations in class, this is an open book examine, and these equations are in your book. Using the above data calculate the K_i , or binding constant of the inhibitor with the enzyme. (Bonus 5 points)