

You study kinetics of an enzyme E as a function of substrate concentration first without any inhibitor and then in the presence of 20  $\mu\text{M}$  of inhibitor A or inhibitor B (see the Table below). The enzyme concentration is maintained constant at 0.1  $\mu\text{M}$  level. The substrate concentrations are shown in the Table below. Answer the following questions.

1. From these data determine  $V_{\text{max}}$ ,  $K_m$ , and the turnover number ( $k_{\text{cat}}$ ) for the enzyme E in the absence of any inhibitors.
2. Determine the type of inhibition for A and B.
3. Using your answer to question 2, determine the dissociation constant for each inhibitor. Explain your reasoning.

*Comments:*

1. Using Lineweaver-Burk plot might be helpful in answering most of these questions.
2. Please pay attention to units.

[S], $\mu\text{M}$	$V_0$ , $\mu\text{M}/\text{min}$ No inhibitor added	$V_0$ , $\mu\text{M}/\text{min}$ + Inhibitor A	$V_0$ , $\mu\text{M}/\text{min}$ + Inhibitor B
20	1.4286	0.5882	0.8333
30	1.8750	0.8333	0.9677
50	2.5000	1.2500	1.1111
70	2.9167	1.5909	1.1864
100	3.3333	2.0000	1.2500
150	3.7500	2.5000	1.3043
200	4.0000	2.8571	1.3333
300	4.2857	3.3333	1.3636