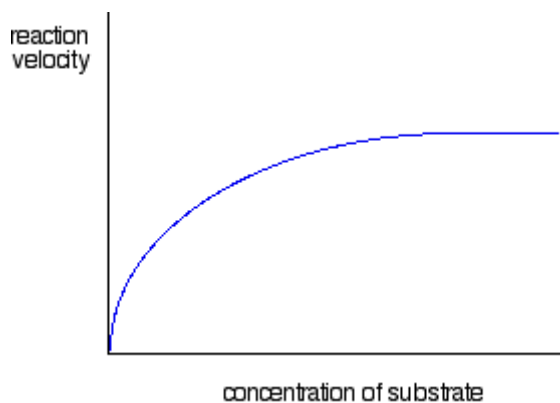


Chemguide – questions

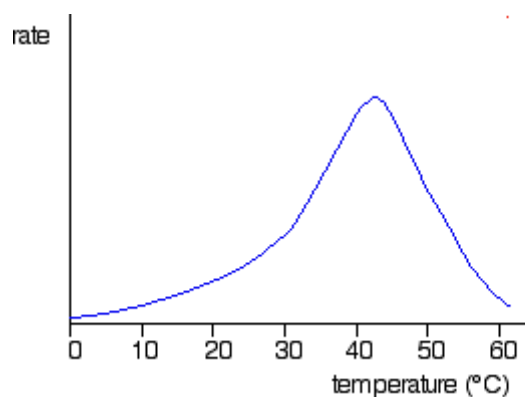
PROTEINS: CHANGING CONDITIONS IN ENZYME CATALYSIS

1. If you plot the initial rates of an enzyme-controlled reaction against the substrate concentration you get this graph (taken from the Chemguide page).



Explain the shape of the graph.

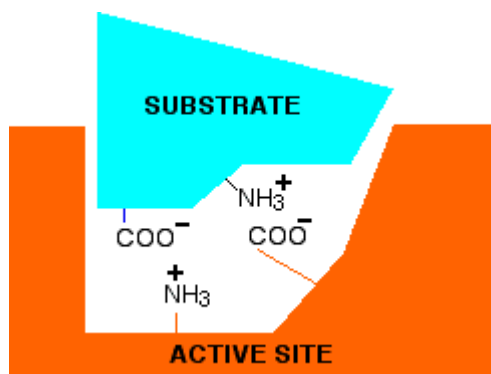
2. Two numbers associated with an enzyme-controlled reaction are V_{\max} and K_M (the Michaelis constant). Don't waste time on this question unless you are sure this is on your syllabus.
- Show on the graph how you would find the value for V_{\max} .
 - Show on the graph how you would find the value for K_M .
 - Suppose you had two enzymes with K_M values of 1.5×10^{-2} and 3.0×10^{-4} . Which one is working more effectively? Explain your answer.
3. This graph (taken from the Chemguide page) shows the effect of temperature on the rate of a typical enzyme-controlled reaction.



Explain the shape of the graph.

Chemguide – questions

4. Suppose an enzyme with an optimum pH of around 7 attached its substrate to its active site using the ionic attractions shown in this diagram taken from the Chemguide page.



- a) Explain what would happen if the pH of the solution was made more acidic.
- b) Explain what would happen if the pH of the solution was made more alkaline.
- c) At extreme pHs (either very acidic or very alkaline), the whole enzyme molecule might be affected – not just the active site. Explain why.