

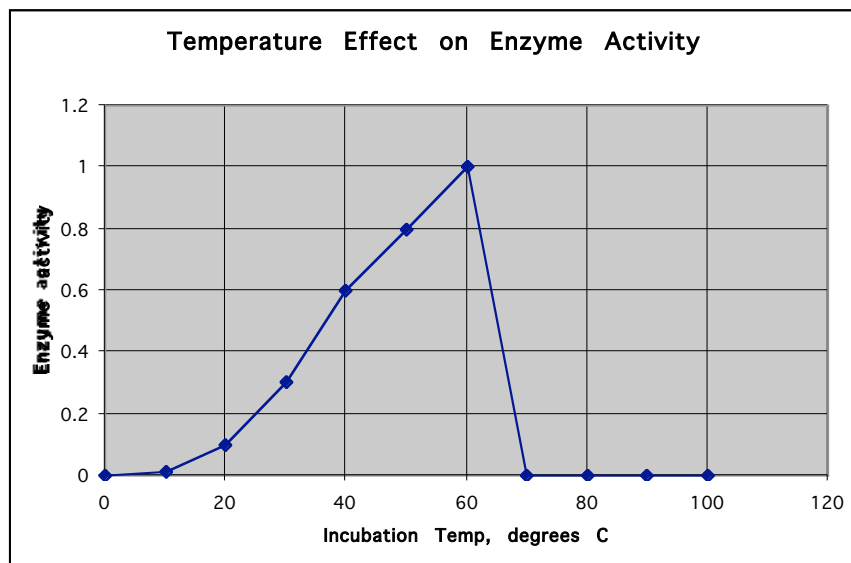
ANSWERS TO PROBLEMS (Energy and Enzymes):

1. Enzyme X catalyzes the conversion of molecule A to B. Compound Z is a competitive inhibitor of enzyme X. This means that _____.

- a. Z and A can both bind to active site of enzyme X.
- b. Z competes with the enzyme for binding to active site.
- c. Z binds to the regulatory subunit of enzyme X.
- d. A and B compete with Z for production of product.
- e. enzyme X must be made of at least two subunits.
- f. Z binds to a site on the enzyme other than the active site.

2. How would your answers change to #1 if Z was a noncompetitive inhibitor of Enzyme X ?

Answer would be "f"



3. Answer the following questions based on the above graph:

- a. What is the optimum temperature for this enzyme? **60°C**
- b. What happens at temperatures of 70°C and higher ? **Inactivity is likely the result of the enzyme being denatured or coagulated by the elevated temperature.**
- c. How could you test whether this effect was reversible? **Incubate the samples at the optimum temperature (60°C). If the enzyme is denatured by the higher temperature, it will re-fold into a functional conformation and recover its activity. If the enzyme is coagulated by the elevated temperature, it will remain inactive at the optimum temperature.**
- d. What happens at 0°C? How could you test whether this effect is reversible ? **Inactivity is likely a result of slowed molecular motion. The reversibility could be tested by incubating the solution at the optimum temperature. Production of product at a faster rate would be consistent with this effect being reversible.**