

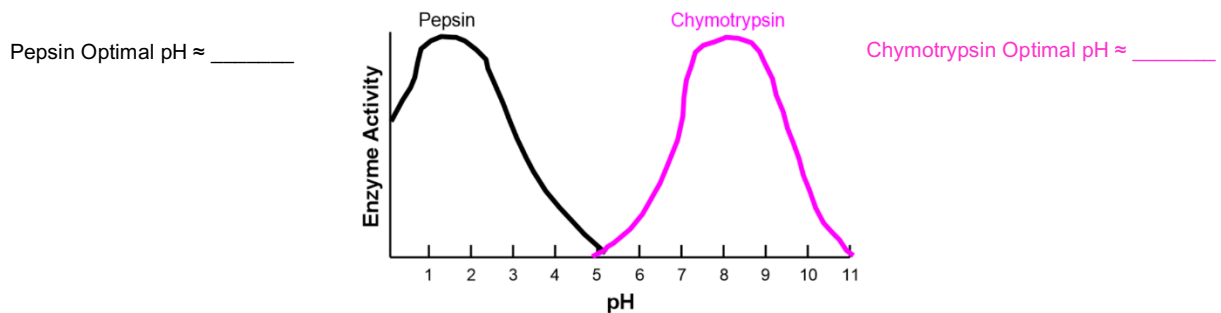
CONCEPT: OPTIMAL ENZYME CONDITIONS

- Proper enzyme catalysis requires *specific* conditions, including _____ & _____.

Optimal pH

- Most enzymes have an _____ pH where they display their greatest amount of activity.
 - Enzymes are _____ to pH & different enzymes have their own optimal pH.
- Recall: Charges of ionizable amino acids can _____ with pH.
 - pH changes could cause active site amino acids to change their _____ & hinder catalysis.
 - Changing the pH significantly enough could cause an enzyme to _____.

EXAMPLE: What is the approximate optimal pH for pepsin & chymotrypsin?

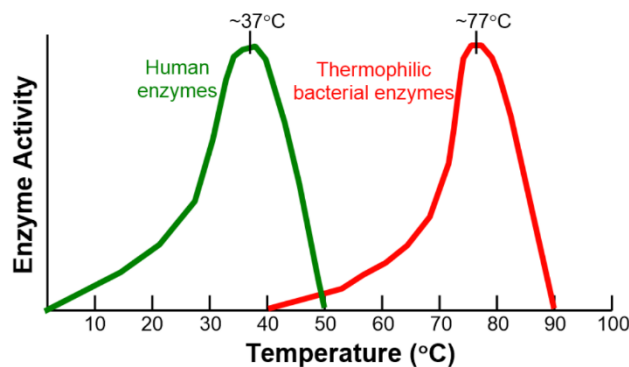


PRACTICE: Which of the following is true of enzyme catalysts?

- Their catalytic activity is independent of pH.
- They are generally equally active on D and L isomers of a given substrate.
- They can increase the equilibrium constant for a given reaction by a thousand-fold or more.
- They can increase the reaction rate for a given reaction by a thousand-fold or more.

Optimal Temperature

- Most enzymes also have an optimal _____ where they display their greatest amount of activity.



PRACTICE: The best way to increase the reaction rate for an enzyme saturated with substrate is always to:

- Increase the pH.
- Increase the temperature.
- Increase [enzyme].
- Increase [substrate].

CONCEPT: OPTIMAL ENZYME CONDITIONS

PRACTICE: Which of the following statements about enzymes is false?

- a) Enzymes carry out multiple rounds of a given chemical reaction.
- b) Enzymes accelerate the speed at which reactions get to equilibrium by lowering the activation energy barrier.
- c) Enzymes can denature under highly acidic or basic conditions.
- d) Enzymes push the reaction equilibrium toward product formation.
- e) Enzymes are biological molecular catalysts.