How can the rate (speed) of a chemical reaction be affected?

1. The temperature: graph the following.

|  |  |
| --- | --- |
| Temperature | Rate of reaction |
| 0 | 0 |
| 5 | 2 |
| 10 | 5 |
| 15 | 10 |
| 20 | 15 |
| 25 | 20 |
| 30 | 25 |
| 35 | 30 |
| 40 | 35 |
| 45 | 15 |
| 50 | 0 |
| 60 | 0 |
| 70 | 0 |

1. What happened when the heat was raised between 0 degrees and 40 degrees?
2. What is the optimum temperature for the enzyme?
3. What happens to the rate of reaction when the temp goes above 40 degrees?
4. What physically happens to enzymes when they get too hot?
5. Write a sentence explaining how heat affects the rate of a reaction?
6. pH affects the rate of reactions: Graph the following

Pepsin Trypsin

|  |  |  |  |
| --- | --- | --- | --- |
| pH | Rate of reaction | pH | Rate of reaction |
| 1 | 10 | 1 | 0 |
| 2 | 30 | 2 | 0 |
| 3 | 50 | 3 | 0 |
| 4 | 30 | 4 | 5 |
| 5 | 15 | 5 | 15 |
| 6 | 5 | 6 | 25 |
| 7 | 0 | 7 | 35 |
| 8 | 0 | 8 | 55 |
| 9 | 0 | 9 | 35 |
| 10 | 0 | 10 | 25 |
| 11 | 0 | 11 | 15 |
| 12 | 0 | 12 | 5 |

1. What is pepsins optimum pH?
2. What is the optimum pH for trypsin?
3. Which one works best in a basic environment?
4. Which enzyme works best in an acidic environment?
5. The concentration or amount of enzyme affects the rate: Graph the following

|  |  |
| --- | --- |
| Enzyme concentration | Rate of reaction |
| 0 | 0 |
| 10 | 20 |
| 20 | 40 |
| 30 | 60 |
| 40 | 60 |
| 50 | 60 |
| 60 | 60 |
| 70 | 60 |
| 80 | 60 |

1. Why can the reaction increase when more enzyme is added from 0 – 30?
2. What cant it get any faster after 30?
3. Write a sentence explaining how enzyme concentration can affect reaction rate.
4. Substrate concentration or amount can affect reaction rate: Graph the following

|  |  |
| --- | --- |
| Substrate concentration | Rate of reaction |
| 0 | 0 |
| 10 | 20 |
| 20 | 40 |
| 30 | 60 |
| 40 | 60 |
| 50 | 60 |
| 60 | 60 |
| 70 | 60 |
| 80 | 60 |

1. Why can the reaction increase when more substrate is added from 0 – 30?
2. What cant it get any faster after 30?
3. Write a sentence explaining how substrate concentration can affect reaction rate.