

What are Catalysts?

Worksheet

A catalyst accelerates a reaction by lowering the activation energy (E_a), enabling more molecules to react per unit time. It emerges unchanged from the reaction.

Questions

1. What does a catalyst lower?

- A) Temperature
- B) Activation energy
- C) Pressure
- D) Product amount

2. Is a catalyst consumed in the reaction?

- A) Yes, completely
- B) No, it emerges unchanged
- C) Partially consumed
- D) Only if temperature is high

3. A reaction without catalyst takes 10 hours; with catalyst, 1 hour. The ratio is:

- A) 1
- B) 5
- C) 10
- D) 100

4. Does a catalyst change the equilibrium position?

- A) Yes, always
- B) No, only the rate of reaching equilibrium
- C) Only if concentration is high
- D) Only in aqueous solution

5. Why does a catalyst not get consumed even though it participates in the reaction?

6. At 25°C, an uncatalyzed reaction takes 2 hours. With a catalyst, it takes 5 minutes. How much faster?

7. A car's catalytic converter uses platinum. Why is platinum not 'used up'?

8. Define: What is a catalyst?

9. Define: How does a catalyst work?

10. Define: Is a catalyst consumed in the reaction?

Answer Key

1. B) Activation energy - Catalysts specifically lower activation energy, enabling the reaction to proceed faster.
2. B) No, it emerges unchanged - A catalyst is regenerated after each reaction cycle - not consumed.
3. C) 10 - 10 hours / 1 hour = 10 faster. The reaction rate increased 10-fold.
4. B) No, only the rate of reaching equilibrium - A catalyst speeds up reaching equilibrium but does not change the equilibrium position.
5. A catalyst lowers activation energy by bonding to reactants, forming an intermediate complex. This intermediate reacts with other reactants. The catalyst is regenerated after the reaction - not consumed.
6. Time ratio = 2 hours / 5 minutes = 120 min / 5 min = 24. The catalyst made the reaction 24 times faster. Note: same temperature, same final equilibrium position.
7. Platinum is a catalyst - it speeds up the breakdown of harmful gases. After each reaction cycle, platinum returns to its original form. One platinum atom can catalyze billions of reaction cycles.
8. A substance that speeds up a chemical reaction without being consumed in the reaction.
9. It lowers the activation energy, allowing more molecules to overcome the energy barrier per unit time.
10. No, it emerges unchanged and can be used repeatedly.

Bounlu

All cards, step-by-step solutions and an AI tutor are in the Notek app.
Promy turns exam dates into automatic reminders.