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Chemistry Grade 10 — Chapter 5

Reaction Kinetics

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Independent practice MCQs from the supplied Class 10 Chemistry notes pack. Total: 50 questions.

A. Important / Main Topics

1. The study of the rate of chemical reactions, their mechanisms, and the factors that influence them is called:

(A) Chemical kinetics
(B) Stoichiometry
(C) Electrochemistry
(D) Thermodynamics

Correct Answer: A

Explanation: Chemical kinetics is the study of the rate of chemical reactions, their mechanisms, and the factors that influence them.

2. The rate of a chemical reaction is the change in the concentration of a reactant or product in a given:

(A) Volume
(B) Time
(C) Temperature
(D) Pressure

Correct Answer: B

Explanation: The rate of a chemical reaction is the change in the concentration of a reactant or product in a given Time.

3. What is the unit for the rate of reaction?

(A) mol dm□³
(B) dm³ s□¹
(C) mol dm□³ s□¹
(D) mol s□¹

Correct Answer: C

Explanation: The unit for rate of reaction is mol dm□³ s□¹.

4. For a reaction to occur according to collision theory, the colliding particles must have:

(A) Low energy and random orientation
(B) Only enough energy
(C) Only correct orientation
(D) Enough energy and correct orientation

Correct Answer: D

Explanation: For a reaction to occur, the colliding particles must have enough energy and correct orientation.

5. The minimum amount of kinetic energy that the interacting particles must have is known as:

(A) Activation energy
(B) Potential energy
(C) Internal energy
(D) Kinetic energy

Correct Answer: A

Explanation: The minimum kinetic energy needed for a reaction is called activation energy.

6. A substance that accelerates a chemical reaction but does not change its chemical structure at the end is called a:

(A) Reactant

(B) Catalyst
(C) Product
(D) Solvent

Correct Answer: B

Explanation: A substance that accelerates a chemical reaction but does not change its chemical structure at the end is called a Catalyst.

7. Which of the following factors affects the rate of a reaction by changing the number of successful collisions?

(A) Colour of the reactant
(B) Smell of the product
(C) Concentration of reactants
(D) Density of the container

Correct Answer: C

Explanation: Concentration of reactants — this correctly answers the question.

8. Reactions with high activation energy are usually:

(A) Fast
(B) Exothermic
(C) Reversible
(D) Slow

Correct Answer: D

Explanation: Reactions with high activation energy are usually slow.

9. In a reversible reaction, a catalyst lowers the activation energy of the:

(A) Forward as well as reverse reaction
(B) Forward reaction only
(C) Reverse reaction only
(D) Neither reaction

Correct Answer: A

Explanation: In a reversible reaction, a catalyst lowers the activation energy of the Forward as well as reverse reaction.

10. Enzymes are catalysts in living organisms. They are:

(A) Carbohydrates
(B) Proteins
(C) Lipids
(D) Nucleic acids

Correct Answer: B

Explanation: Enzymes are catalysts in living organisms. They are Proteins.

11. The rate of a reaction generally _____ as the reaction proceeds.

(A) Increases
(B) Remains the same
(C) Decreases
(D) Becomes zero immediately

Correct Answer: C

Explanation: The rate of a reaction generally decreases as the reaction proceeds because the concentration of reactants decreases.

12. The activation energy for a reaction can be:

(A) Increased by increasing temperature
(B) Increased by decreasing temperature
(C) Decreased by increasing concentration of reactants
(D) Decreased by using a catalyst

Correct Answer: D

Explanation: The activation energy for a reaction can be decreased by using a catalyst.

13. When the temperature of a reaction increases, the particles:

(A) Move faster and collide more often
(B) Move slower and collide less often
(C) Stop moving
(D) Change colour

Correct Answer: A

Explanation: When the temperature of a reaction increases, the particles Move faster and collide more often.

14. Which of the following is NOT a factor that affects the rate of a reaction?

(A) Concentration of reactants
(B) Colour of the product
(C) Surface area
(D) Temperature

Correct Answer: B

Explanation: Colour of the product — this correctly answers the question.

15. A graph called the Maxwell-Boltzmann curve shows:

(A) The colour of a gas
(B) The density of a solid
(C) The distribution of energy among particles
(D) The smell of a reaction

Correct Answer: C

Explanation: The Maxwell-Boltzmann curve shows the distribution of energy among particles.

16. Powdered zinc reacts with dilute HCl faster than a solid chunk of zinc because:

(A) The powder has a lower activation energy
(B) The powder has a higher concentration
(C) The powder has a higher temperature
(D) The powder has more surface area exposed

Correct Answer: D

Explanation: Powdered zinc reacts faster because it has more surface area exposed.

17. When the temperature increases, the Maxwell-Boltzmann curve:

(A) Shifts to higher energies
(B) Shifts to lower energies
(C) Remains the same
(D) Disappears

Correct Answer: A

Explanation: When the temperature increases, the Maxwell-Boltzmann curve Shifts to higher energies.

18. In a pressure cooker, food cooks faster because:

(A) The pressure decreases the boiling point of water
(B) The pressure increases the boiling point of water
(C) The pressure increases the activation energy
(D) The pressure decreases the surface area

Correct Answer: B

Explanation: In a pressure cooker, food cooks faster because The pressure increases the boiling point of water.

19. Which of the following statements about a catalyst is correct?

(A) A catalyst is consumed in the reaction
(B) A catalyst changes the outcome of the reaction
(C) A catalyst lowers the activation energy
(D) A catalyst increases the activation energy

Correct Answer: C

Explanation: A catalyst lowers the activation energy — this correctly answers the question.

20. Why is it important for a catalyst to remain unchanged at the end of a reaction?

(A) So it can change the outcome
(B) So it can increase the activation energy
(C) So it can stop the reaction
(D) So it can be reused

Correct Answer: D

Explanation: A catalyst is not consumed and can be recovered and reused.

21. Which of the following is a biological catalyst?

(A) Enzyme
(B) Iron
(C) Platinum
(D) Vanadium pentaoxide

Correct Answer: A

Explanation: Enzyme — this correctly answers the question.

22. The rate of reaction between two specific time intervals is called the:

(A) Instantaneous rate
(B) Average rate
(C) Initial rate
(D) Final rate

Correct Answer: B

Explanation: The rate of reaction between two specific time intervals is called the average rate of reaction.

23. Which of the following statements about the rate of reaction is correct?

(A) The rate of reaction is constant throughout the reaction
(B) The rate of reaction is slowest at the beginning and speeds up over time
(C) The rate of reaction is fastest at the beginning and slows down over time
(D) The rate of reaction does not change with time

Correct Answer: C

Explanation: The rate of reaction is fastest at the beginning and slows down over time.

24. In a chemical reaction, bonds between atoms are broken and new bonds are formed. This process is explained by:

(A) Stoichiometry
(B) Electrochemistry
(C) Thermodynamics
(D) Collision theory

Correct Answer: D

Explanation: In a chemical reaction, bonds between atoms are broken and new bonds are formed. This process is explained by Collision theory.

25. A catalyst provides an easier pathway for a reaction by:

(A) Decreasing the activation energy
(B) Increasing the activation energy
(C) Increasing the temperature
(D) Decreasing the concentration

Correct Answer: A

Explanation: A catalyst provides an easier pathway for a reaction by Decreasing the activation energy.

B. Less Important / Secondary Topics

26. In a Maxwell-Boltzmann curve, the area under the curve represents:

(A) The total number of particles
(B) The activation energy
(C) The reaction rate
(D) The temperature

Correct Answer: A

Explanation: In a Maxwell-Boltzmann curve, the area under the curve represents The total number of particles.

27. Which of the following is an example of a reaction that is fast at room temperature?

(A) Fermentation of glucose
(B) Acid-base neutralization
(C) Digestion of food
(D) Rusting of iron

Correct Answer: B

Explanation: Acid-base neutralization is a fast reaction, taking only a few microseconds.

28. In the Haber process, a catalyst is used to:

(A) Increase the yield of ammonia
(B) Decrease the yield of ammonia
(C) Speed up the reaction
(D) Change the equilibrium position

Correct Answer: C

Explanation: A catalyst is used to speed up the reaction, not to change the yield or equilibrium position.

29. A catalyst does NOT:

(A) Lower the activation energy
(B) Speed up the reaction
(C) Provide an easier pathway
(D) Get consumed in the reaction

Correct Answer: D

Explanation: A catalyst is not consumed in the reaction.

30. In a reaction between H□ and Cl□ to form HCl, the activated complex is:

(A) A temporary, high-energy state
(B) The final product
(C) A stable intermediate
(D) The reactant

Correct Answer: A

Explanation: The activated complex is a temporary, high-energy state.

31. The rate of a reaction can be increased by:

(A) Decreasing the temperature
(B) Increasing the surface area of a solid reactant
(C) Decreasing the concentration of reactants
(D) Adding a catalyst that increases activation energy

Correct Answer: B

Explanation: The rate of a reaction can be increased by Increasing the surface area of a solid reactant.

32. Which of the following is NOT a characteristic of enzymes?

(A) They are proteins
(B) They are highly specific
(C) They are consumed in the reaction
(D) They speed up reactions in living organisms

Correct Answer: C

Explanation: Enzymes are not consumed in the reaction.

33. Which of the following factors affects the rate of a reaction by changing the number of successful collisions?

(A) Colour of the reactant
(B) Smell of the product
(C) Density of the container
(D) Concentration of reactants

Correct Answer: D

Explanation: Concentration of reactants — this correctly answers the question.

34. A substance that accelerates a chemical reaction but does not change its chemical structure at the end is called a:

(A) Catalyst
(B) Reactant
(C) Product
(D) Solvent

Correct Answer: A

Explanation: A substance that accelerates a chemical reaction but does not change its chemical structure at the end is called a Catalyst.

35. The minimum amount of kinetic energy that the interacting particles must have is known as:

(A) Potential energy
(B) Activation energy
(C) Internal energy
(D) Kinetic energy

Correct Answer: B

Explanation: The minimum kinetic energy needed for a reaction is called activation energy.

36. Which of the following statements about the rate of reaction is correct?

(A) The rate of reaction is constant throughout the reaction
(B) The rate of reaction is slowest at the beginning and speeds up over time
(C) The rate of reaction is fastest at the beginning and slows down over time
(D) The rate of reaction does not change with time

Correct Answer: C

Explanation: The rate of reaction is fastest at the beginning and slows down over time.

37. In a chemical reaction, bonds between atoms are broken and new bonds are formed. This process is explained by:

(A) Stoichiometry
(B) Electrochemistry
(C) Thermodynamics
(D) Collision theory

Correct Answer: D

Explanation: In a chemical reaction, bonds between atoms are broken and new bonds are formed. This process is explained by Collision theory.

38. A catalyst provides an easier pathway for a reaction by:

(A) Decreasing the activation energy
(B) Increasing the activation energy
(C) Increasing the temperature
(D) Decreasing the concentration

Correct Answer: A

Explanation: A catalyst provides an easier pathway for a reaction by Decreasing the activation energy.

39. In a Maxwell-Boltzmann curve, the area under the curve represents:

(A) The activation energy

(B) The total number of particles
(C) The reaction rate
(D) The temperature

Correct Answer: B

Explanation: In a Maxwell-Boltzmann curve, the area under the curve represents The total number of particles.

40. Which of the following is an example of a reaction that is fast at room temperature?

(A) Fermentation of glucose
(B) Digestion of food
(C) Acid-base neutralization
(D) Rusting of iron

Correct Answer: C

Explanation: Acid-base neutralization is a fast reaction, taking only a few microseconds.

41. In the Haber process, a catalyst is used to:

(A) Increase the yield of ammonia
(B) Decrease the yield of ammonia
(C) Change the equilibrium position
(D) Speed up the reaction

Correct Answer: D

Explanation: A catalyst is used to speed up the reaction, not to change the yield or equilibrium position.

42. A catalyst does NOT:

(A) Get consumed in the reaction
(B) Lower the activation energy
(C) Speed up the reaction
(D) Provide an easier pathway

Correct Answer: A

Explanation: A catalyst is not consumed in the reaction.

43. In a reaction between H□ and Cl□ to form HCl, the activated complex is:

(A) The final product
(B) A temporary, high-energy state
(C) A stable intermediate
(D) The reactant

Correct Answer: B

Explanation: The activated complex is a temporary, high-energy state.

44. The rate of a reaction can be increased by:

(A) Decreasing the temperature
(B) Decreasing the concentration of reactants
(C) Increasing the surface area of a solid reactant
(D) Adding a catalyst that increases activation energy

Correct Answer: C

Explanation: The rate of a reaction can be increased by Increasing the surface area of a solid reactant.

45. Which of the following is NOT a characteristic of enzymes?

(A) They are proteins
(B) They are highly specific
(C) They speed up reactions in living organisms
(D) They are consumed in the reaction

Correct Answer: D

Explanation: Enzymes are not consumed in the reaction.

46. Why is it important for a catalyst to remain unchanged at the end of a reaction?

(A) So it can be reused

(B) So it can change the outcome
(C) So it can increase the activation energy
(D) So it can stop the reaction

Correct Answer: A

Explanation: A catalyst is not consumed and can be recovered and reused.

47. Which of the following is a biological catalyst?

(A) Iron
(B) Enzyme
(C) Platinum
(D) Vanadium pentaoxide

Correct Answer: B

Explanation: Enzyme — this correctly answers the question.

48. The rate of reaction between two specific time intervals is called the:

(A) Instantaneous rate
(B) Initial rate
(C) Average rate
(D) Final rate

Correct Answer: C

Explanation: The rate of reaction between two specific time intervals is called the average rate of reaction.

49. Which of the following statements about the rate of reaction is correct?

(A) The rate of reaction is constant throughout the reaction
(B) The rate of reaction is slowest at the beginning and speeds up over time
(C) The rate of reaction does not change with time
(D) The rate of reaction is fastest at the beginning and slows down over time

Correct Answer: D

Explanation: The rate of reaction is fastest at the beginning and slows down over time.

50. In a chemical reaction, bonds between atoms are broken and new bonds are formed. This process is explained by:

(A) Collision theory
(B) Stoichiometry
(C) Electrochemistry
(D) Thermodynamics

Correct Answer: A

Explanation: In a chemical reaction, bonds between atoms are broken and new bonds are formed. This process is explained by Collision theory.