Chemical Reaction Rates and Rate Laws

Chemistry · Practice Test · 27 Questions

1. Which type of reaction is characterized by completion within a short time?

A) Slow Reaction
B) Fast Reaction
C) Moderate Reaction
D) Very Slow Reaction

2. Which of the following is an example of a fast reaction?

A) Corrosion of Iron
B) Combustion of Methane
C) Setting of Cement
D) Rusting of Iron

3. What does 'Rate of Reaction' primarily measure?

A) Change in temperature
B) Change in pressure
C) Change in concentration of reactants or products over time
D) Change in mass of reactants

4. Which type of reaction requires years for completion?

A) Fast Reaction
B) Moderate Reaction
C) Very Slow Reaction
D) Instantaneous Reaction

5. What does the term 'Kinetics' relate to in chemistry?

A) The equilibrium state of a reaction
B) The rate of chemical reactions
C) The enthalpy change of a reaction
D) The structure of molecules

6. How is the average rate of reaction calculated?

A) Change in time divided by change in concentration
B) Change in concentration divided by change in time
C) Sum of initial and final concentrations
D) Product of initial and final concentrations

7. In the formula Rate = (higher value - lower value) / (time interval), what do 'higher value' and 'lower value' typically represent?

A) Temperatures
B) Pressures
C) Concentrations of reactants or products
D) Volumes

8. What does 'd[A]' represent in the context of instantaneous rate?

A) The total change in concentration of A
B) The rate of change of concentration of A
C) The initial concentration of A
D) The final concentration of A

9. When calculating the rate of a reaction involving multiple reactants, what is important to consider regarding the stoichiometric coefficients?

A) They are not used
B) They are used to calculate mass ratios
C) They are used to calculate mole ratios
D) They represent the rate constant

10. The rate law of a reaction expresses the relationship between the rate of reaction and:

A) Temperature and pressure
B) Concentrations of reactants
C) Volume of the container
D) Stoichiometric coefficients

11. What is the general form of a rate law expression involving reactants A and B?

A) Rate = k[A] + [B]
B) Rate = k[A] - [B]
C) Rate = k[A]^x [B]^y
D) Rate = k / ([A][B])

12. In the rate law, 'k' represents:

A) The rate of reaction
B) The concentration of reactants
C) The rate constant
D) The order of reaction

13. How does the rate constant 'k' typically change with an increase in temperature?

A) It decreases
B) It remains constant
C) It increases
D) It becomes zero

14. A larger value of the rate constant 'k' indicates:

A) A slower reaction
B) A faster reaction
C) An equilibrium reaction
D) A reaction that does not occur

15. The value of the rate constant 'k' is primarily dependent on:

A) Concentration of reactants
B) Pressure
C) Temperature
D) Volume

16. What does the term 'Elementary Reaction' refer to?

A) A reaction that occurs in multiple steps
B) A reaction that occurs in a single step
C) A reaction that is reversible
D) A reaction that is very slow

17. Reactions that occur in more than one step are called:

A) Elementary reactions
B) Fast reactions
C) Multi-step reactions
D) Instantaneous reactions

18. For a gaseous reaction, the rate law is often expressed in terms of:

A) Concentration in mol/L
B) Partial pressures
C) Mass in grams
D) Moles

19. The units of the rate constant 'k' depend on:

A) The temperature
B) The order of the reaction
C) The volume of the container
D) The pressure

20. Which of the following is NOT a factor that influences the rate of a reaction?

A) Temperature
B) Concentration of reactants
C) Physical state of reactants
D) The color of the reactants

21. What is the term for a reaction that proceeds to completion?

A) Reversible reaction
B) Equilibrium reaction
C) Complete reaction
D) Irreversible reaction

22. In the expression Rate = k[A]^x [B]^y, what do 'x' and 'y' represent?

A) Stoichiometric coefficients
B) Order of reaction with respect to A and B
C) Rate constants
D) Concentrations

23. What is the overall order of a reaction if its rate law is Rate = k[A]^1 [B]^1?

A) 1
B) 2
C) 3
D) 0

24. The corrosion of iron is an example of which type of reaction?

A) Fast reaction
B) Slow reaction
C) Moderate reaction
D) Instantaneous reaction

25. What is the instantaneous rate of reaction?

A) The average rate over a long period
B) The rate at a specific point in time
C) The rate at the beginning of the reaction
D) The rate at the end of the reaction

26. The expression -d[A]/dt represents the rate of disappearance of reactant A.

A) True
B) False

27. The expression +d[B]/dt represents the rate of formation of product B.

A) True
B) False