

# Chemical Reaction Rates and Rate Laws

Chemistry · Answer Key · 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  $\text{Rate} = (\text{higher value} - \text{lower value}) / (\text{time interval})$ , 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)  $\text{Rate} = k[A] + [B]$
- B)  $\text{Rate} = k[A] - [B]$
- C)  $\text{Rate} = k[A]^x [B]^y$**
- D)  $\text{Rate} = k / ([A][B])$

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  $\text{Rate} = k[\text{A}]^x [\text{B}]^y$ , 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  $\text{Rate} = k[\text{A}]^1 [\text{B}]^1$ ?

- 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  $-\text{d}[\text{A}]/\text{d}t$  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