



# Chemical Kinetics Questions



1. Chemical kinetics is the study of the \_\_\_ of a chemical reaction.
2. The rate of a chemical reaction is defined as the change in \_\_\_ per unit time.
3. The reaction rate can be measured by the decrease in \_\_\_ concentration or increase in \_\_\_ concentration.
4. The rate of a reaction is generally expressed in terms of the change in \_\_\_.
5. A zero-order reaction is one where the rate is \_\_\_ of the concentration of the reactants.
6. In a first-order reaction, the rate of the reaction is directly proportional to the concentration of \_\_\_.
7. The half-life period of a reaction is the time required for the concentration of a reactant to reduce to \_\_\_ of its original value.
8. The integrated rate equation for a zero-order reaction is \_\_\_.
9. The rate constant for a zero-order reaction has units of \_\_\_.
10. For a first-order reaction, the integrated rate equation is \_\_\_.
11. The half-life period of a first-order reaction is \_\_\_ of the initial concentration.
12. The molecularity of a reaction is the number of \_\_\_ involved in the rate-determining step.
13. The order of a reaction is the sum of the powers of the concentration terms in the \_\_\_.
14. A second-order reaction is one in which the rate depends on the concentration of \_\_\_ reactants.
15. A catalyst is a substance that \_\_\_ the rate of a reaction without being consumed.
16. The activation energy is the minimum energy required for \_\_\_.
17. The Arrhenius equation relates the rate constant to temperature and \_\_\_.
18. According to the Arrhenius equation, a plot of  $\ln k$  vs  $1/T$  gives a straight line with a slope of \_\_\_.
19. A reaction that occurs in a single step is called an \_\_\_ reaction.
20. The collision theory of reactions states that only those collisions with energy greater than or equal to the \_\_\_ result in a reaction.
21. The transition state theory suggests that reactants pass through a high-energy \_\_\_ state before forming products.
22. The rate of a chemical reaction increases with temperature because more molecules possess \_\_\_ energy.
23. The \_\_\_ of a reaction refers to the detailed sequence of elementary steps by which the overall reaction occurs.
24. In a bimolecular reaction, two molecules collide to form \_\_\_.
25. The pre-exponential factor in the Arrhenius equation represents the \_\_\_ of collisions that result in a reaction.
26. For a second-order reaction, the rate constant has units of \_\_\_.
27. The method of determining the order of a reaction from experimental data is called the \_\_\_ method.
28. The time required for 50% completion of a reaction is called the \_\_\_.
29. A zero-order reaction will have a linear plot of \_\_\_ vs time.
30. In a pseudo-first-order reaction, one reactant is present in \_\_\_ excess.

These questions cover key concepts of chemical kinetics, including reaction rates, order of reactions, and factors affecting the rate of reactions.