Chemical Kinetics

Q.1. The rate of reaction between A and B increases by a factor of 100, when the concentration of A is increased 10 folds, the order of reaction with respect to A is

a) 10
b) 4
c) 2
d) 1

Q.2. Which of the following statements is incorrect?

a) Activation energy for the forward reaction equals activation energy for the reverse reaction
b) For a reversible reaction, an increase in temperature increases the reaction rate for both the forward and the backward reaction
c) The larger the initial reactant concentration for a second order reaction, the shorter its half-life
d) When Δt is infinitesimally small, the average rate equals the instantaneous rate

Q.3.

$3A \longrightarrow 2B$, rate of reaction, $\frac{+d[B]}{dt}$ is equal to

a)
$$-\frac{3}{2}\frac{d[A]}{dt}$$

b)
$$-\frac{2}{3}\frac{d[A]}{dt}$$

c)
$$-\frac{1}{3}\frac{d[A]}{dt}$$

d)
$$+2\frac{d[A]}{dt}$$

Q.4. . A chemical reaction was carried out at 300 K and 280 K. The rate constants were found to be K_1 and K_2 respectively. then

a) $K_1 = 4K_2$
b) $K_2 = 2K_1$
c) $K_2 = 0.25K_1$
d) $K_2 = 0.5K_1$

Q.5. The rate constant of a reaction is 10.8×10^{-5} mol $dm^{-3}s^{-1}$. The order of the reaction is

a) 0
b) 1
c) 2
d) 3

Q.6. Half-life of a reaction is found to be inversely proportional to the square of initial concentration. The order of reaction is

a) 4
b) 3
c) 5
d) 2

Q.7. If initial concentration is reduced to $1/4^{th}$ in a zero order reaction, the time taken for half the rection to complete

a) remains same
b) becomes 4 times
c) becomes one-fourth
d) doubles

Q.8. A catalyst increases rate of reaction by

a) decreasing enthalpy
b) decreasing internal energy
c) decreasing activation energy
d) increasing activation energy

Q.9. For an endothermic reaction, energy of activation is Ea and enthalpy of reaction of ΔH(both of these in kJ/mol). Minimum value of Ea will be.

a) less than ΔH
b) equal to ΔH
c) more than ΔH
d) equal to zero

Q.10. The rate of the reaction $2N_2O_5 \rightarrow 4NO_2 + 2O_2$ can be written in three ways . The relationship between k and k' and between k and k" are :

$$\frac{-d[N_2O_5]}{dt} = k\,[N_2O_5]$$

$$\frac{d[NO_2]}{dt} = k'\,[N_2O_5]$$

$$\frac{d[O_2]}{dt} = k''\,[N_2O_5]$$

a) k' = 2k ; k" = k
b) k' = 2k ; k" = k / 2
c) k'= 2k ; k" = 2k
d) k' = k ; k" = k

Q.11. In the rate equation, when the concentration of reactants is unity then the rate is equal to

a) specific rate constant
b) average rate constant
c) instantaneous rate constant
d) None of the above

Q.12. Which of the following observations is incorrect about the order of a reaction?

a) Order of a reaction is always a whole number
b) The stoichiometric coefficient of the reactants doesn't affect the order
c) Order of reaction is the sum of power to express the rate of reaction to the concentration terms of the reactants.
d) Order can only be assessed experimentally

Q.13. The rate constant of zero-order reactions has the unit

a) s^{-1}
b) mol L^{-1} s^{-1}
c) L^2 mol^{-2} s^{-1}
d) L mol^{-1} s^{-1}

Q.14. In the elementary reaction $2A + B \rightarrow A_2B$, if the concentration of A is doubled and that of B is halved, then the rate of the reaction will

a) remain the same
b) increase 4 times
c) decrease 2 times
d) increase 2 times

Q.15. when the rate of the reaction is equal to the rate constant, the order of the reaction is

a) zero order
b) first order
c) second order
d) third order

Q.16. he number of molecules of the reactants involved in a single stage of the reaction indicates

a) the order of the reaction
b) the molecularity of the reaction
c) the rapid step of the reaction mechanism, and
d) the reaction half-life.

Q.17. A first order reaction has a half-life length of 10 minutes. In 100 minutes, what proportion of the response will be completed?

a) 25%
b) 50%
c) 99.9%
d) 75%

Q.18. In pseudo unimolecular reactions,

a) both reactants are present in low concentrations,
b) both reactants are present in the same concentrations,
c) one reactant is present in excess,
d) one reactant is non-reactive.

Q.19. Which reaction's rate increases as the temperature rises?

a) Exothermic reaction
b) Endothermic reaction
c) both Exothermic and Endothermic reaction
d) None of the above

Q.20. The rate of chemical reaction is doubled for every 10°C rise in temperature because of

a) increase in the activation energy
b) decrease in the activation energy
c) increase in the number of molecular collisions
d) increase in the number of activated molecules

Q.21. The temperature coefficient of most of the reactions lies between

a) 1 and 3
b) 1 and 4
c) 2 and 4
d) 2 and 3

Q.22. For a first-order reaction, the half life period is independent of

a) initial concentration
b) cube root of initial concentration
c) first power of final concentration
d) square root of final concentration

Q.23. If initial concentration is reduced to 1/4th in a zero order reaction, the time taken for half the rection to complete

a) remains same
b) becomes one-fourth
c) becomes 4 times
d) doubles

Q.24. Collision theory is applicable to

a) first order reactions
b) bimolecular reactions
c) intra-molecular reactions
d) zero order reactions

Q.25. The formation of gas at high pressure at the surface of tungsten due to adsorption is the reaction of order

a) 0
b) 1
c) 2
d) insufficient data.