Rate of a reaction

1. The rate of a chemical reaction
(a) Increases as the reaction proceeds
(b) Decreases as the reaction proceeds
(c) May increase or decrease during the reaction
(d) Remains constant as the reaction proceeds

2. The rate of a reaction that not involve gases is not dependent on
(a) Pressure
(b) Temperature
(c) Concentration
(d) Catalyst

3. The rate at which a substance reacts depends on its
(a) Atomic weight
(b) Equivalent weight
(c) Molecular weight
(d) Active mass

4. The rate law for the reaction $RCl + NaOH(aq) \rightarrow ROH + NaCl$ is given by Rate $= K_1[RCl]$. The rate of the reaction will be
(a) Doubled on doubling the concentration of sodium hydroxide
(b) Halved on reducing the concentration of alkyl halide to one half
(c) Decreased on increasing the temperature of the reaction
(d) Unaffected by increasing the temperature of the reaction

5. If doubling the concentration of a reactant `A' increases the rate 4 times and tripling the concentration of `A' increases the rate 9 times, the rate is proportional to
(a) Concentration of `A'
(b) Square of concentration of `A'
(c) Under root of the concentration of `A'
(d) Cube of concentration of `A'

6. The rate of chemical reaction at constant temperature is proportional to
(a) The amount of products formed
(b) The product of masses of the reactants
(c) The product of the molar concentration of the reactants
(d) The mean free path of the reaction

7. The concentration of a reactant decreases from 0.2 *M* to 0.1 *M* in 10 minutes. The rate of the reaction is
(a) 0.01 *M*

(b) 10^{-2}

(c) 0.01 $mol\ dm^{-3}\ min^{-1}$

(d) 1 $mol\ dm^{-3}\ min^{-1}$

8. When a reaction is progressing

(a) The rate of the reaction goes on increasing

(b) The concentration of the products goes on decreasing

(c) The concentration of the reactants goes on decreasing

(d) The reaction rate always remains constant

9. In a catalytic conversion of N_2 to NH_3 by Haber's process, the rate of reaction was expressed as change in the concentration of ammonia per time is $40 \times 10^{-3} mol litre^{-1} s^{-1}$. If there are no side reaction, the rate of the reaction as expressed in terms of hydrogen is (in $mol\ litre^{-1} s^{-1}$)

(a) 60×10^{-3} (b) 20×10^{-3}

(c) 1.200 (d) 10.3×10^{-3}

10. If the concentration of the reactants is increased, the rate of reaction

(a) Remains unaffected

(b) Increases

(c) Decreases

(d) May increase or decrease

11. Time required for completion of ionic reactions in comparison to molecular reactions is

(a) Maximum (b) Minimum

(c) Equal (d) None

12. For reaction $2A + B \rightarrow$ products, the active mass of *B* is kept constant and that of *A* is doubled. The rate of reaction will then

(a) Increase 2 times

(b) Increase 4 times

(c) Decrease 2 times

(d) Decrease 4 times

13. In a reaction $2A + B \rightarrow A_2B$, the reactant *A* will disappear at

(a) Half the rate that *B* will decrease

(b) The same rate that *B* will decrease

(c) Twice the rate that *B* will decrease

(d) The same rate that A_2B will form

14. The rate of a gaseous reaction is given by the expression $K[A][B]$. If the volume of the reaction vessel is suddenly reduced to 1/4th of the initial volume, the reaction rate relating to original rate will be

(a) 1/10 (b) 1/8

(c) 8 (d) 16

15. A catalyst increases the rate of reaction because it

(a) Increases the activation energy
(b) Decreases the energy barrier for reaction
(c) Decreases the collision diameter
(d) Increases the temperature coefficient

16. For the reaction $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$ under certain conditions of temperature and partial pressure of the reactants, the rate of formation of NH_3 is $0.001 kgh^{-1}$. The rate of conversion of H_2 under the same conditions is
(a) $1.82 \times 10^{-4} kg/hr$
(b) $0.0015 kg/hr$
(c) $1.52 \times 10^{4} kg/hr$
(d) $1.82 \times 10^{-14} kg/hr$

17. In the reaction $2A + B \rightarrow A_2B$, if the concentration of A is doubled and of B is halved, then the rate of the reaction will
(a) Increase by four times
(b) Decrease by two times
(c) Increase by two times
(d) Remain the same

18. The term $\left(-\frac{dc}{dt}\right)$ in a rate equation refers to the
(a) Concentration of the reactant
(b) Decrease in concentration of the reactant with time
(c) Increase in concentration of the reactant with time
(d) Velocity constant of the reaction

19. The rate of a reaction depends upon the
(a) Volume
(b) Force
(c) Pressure
(d) Concentration of reactant

20. For a given reaction $3A + B \rightarrow C + D$ the rate of reaction can be represented by
(a) $-\frac{1}{3}\frac{d[A]}{dt} = \frac{-d[B]}{dt} = \frac{+d[C]}{dt} = \frac{+d[D]}{dt}$
(b) $-\frac{1}{3}\frac{d[A]}{dt} = \frac{d[C]}{dt} = K[A]^m[B]^n$
(c) $+\frac{1}{3}\frac{d[A]}{dt} = \frac{-d[C]}{dt} = K[A]^n[B]^m$
(d) None of these

21. For the reaction $N_2 + 3H_2 \rightarrow 2NH_3$ if $\frac{\Delta[NH_3]}{\Delta t} = 2 \times 10^{-4} moll^{-1}s^{-1}$, the value of $\frac{-\Delta[H_2]}{\Delta t}$ would be
(a) $1 \times 10^{-4} moll^{-1}s^{-1}$
(b) $3 \times 10^{-4} moll^{-1}s^{-1}$
(c) $4 \times 10^{-4} moll^{-1}s^{-1}$
(d) $6 \times 10^{-4} moll^{-1}s^{-1}$

22. A gaseous hypothetical chemical equation $2A \rightleftharpoons 4B + C$ is carried out in a closed vessel. The concentration of *B* is found to increase by $5 \times 10^{-3} moll^{-1}$ in 10 second. The rate of appearance of *B* is

(a) $5 \times 10^{-4} moll^{-1} sec^{-1}$

(b) $5 \times 10^{-5} moll^{-1} sec^{-1}$

(c) $6 \times 10^{-5} moll^{-1} sec^{-1}$

(d) $4 \times 10^{-4} moll^{-1} sec^{-1}$