Date Planned : __ / __ / __	Daily Tutorial Sheet-1	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-1	Exact Duration :_____

1. For the reaction : $2N_2O_5 \longrightarrow 4NO_2 + O_2$, the rate of reaction in terms of O_2 is $d\left[O_2\right]/dt$. In terms of N_2O_5, it will be:

(A) $\frac{-d[N_2O_5]}{dt}$ **(B)** $\frac{+d\left[N_2O_5\right]}{dt}$ **(C)** $-\frac{1}{2}\frac{d\left[N_2O_5\right]}{dt}$ **(D)** $-2\frac{d\left[N_2O_5\right]}{dt}$

2. In the reaction $A + B \longrightarrow$ Products, keeping [A] constant if [B] is doubled ; the rate becomes double and keeping [B] constant if [A] is doubled ; the rate becomes four times. The order of reaction is :

(A) 1 **(B)** 2 **(C)** 3 **(D)** 4

3. The reaction $H^+ + OH^- \longrightarrow H_2O$ is :

(A) very slow **(B)** slow

(C) fast **(D)** Moderate in speed

4. In a reaction $A \longrightarrow B$; the rate of reaction increases two times on increasing the concentration of the reactant four times, then order of reaction is:

(A) 0 **(B)** 2 **(C)** 1/2 **(D)** –1/2

5. The conversion of $A \longrightarrow B$ follows second order kinetics. Doubling the concentration of A will increase the rate of formation of B by a factor of :

(A) 1/4 **(B)** 2 **(C)** 1/2 **(D)** 4

6. In the following reaction, how is the rate of appearance of the underlined product related to the rate of disappearance of the underlined reactant?

$$BrO_3^-(aq) + 5\underline{\mathbf{Br}}^-(aq) + 6H^+ \longrightarrow 3\underline{\mathbf{Br_2}}(\ell) + 3H_2O(\ell)$$

(A) $\frac{d[Br_2]}{dt} = -\frac{d[Br^-]}{dt}$ **(B)** $\frac{d[Br_2]}{dt} = \frac{3}{5}\frac{d[Br^-]}{dt}$

(C) $\frac{d[Br_2]}{dt} = \frac{-3}{5}\frac{d[Br^-]}{dt}$ **(D)** $\frac{d[Br_2]}{dt} = \frac{-5}{3}\frac{d[Br^-]}{dt}$

7. Unit of rate constant for zero order reaction is :

(A) mole $L^{-1}s^{-1}$ **(B)** $mole^{-1}Ls^{-1}$

(C) s^{-1} **(D)** $mole^{-2}L^2s^{-1}$

8. For a reaction $2NO(g) + Cl_2(g) \longrightarrow 2NOCl(g)$, when concentration of Cl_2 is doubled, the rate becomes four times. What is the order of reaction with respect to Cl_2 ?

(A) 1 **(B)** 2 **(C)** 3 **(D)** 4

9. For the reaction: $N_2 + 3H_2 \rightarrow 2NH_3$; if $\frac{\Delta[NH_3]}{\Delta t} = 2\times10^{-4}$ mol $L^{-1}s^{-1}$, the value of $-\frac{\Delta[H_2]}{\Delta t}$ would be:

(A) 1×10^{-4} mol $L^{-1}s^{-1}$ **(B)** 3×10^{-4} mol $L^{-1}s^{-1}$

(C) 4×10^{-4} mol $L^{-1}s^{-1}$ **(D)** 6×10^{-4} mol $L^{-1}s^{-1}$

10. The rate constant for the reaction, $2N_2O_5 \longrightarrow 4NO_2 + O_2$ is $3.0 \times 10^{-5}\,sec^{-1}$. If the rate is $2.40 \times 10^{-5} mol\,L^{-1}\,sec^{-1}$, then the concentration of N_2O_5 (in mol L^{-1}) is :

(A) 1.4 **(B)** 1.2 **(C)** 0.04 **(D)** 0.8

11. The role of catalyst in a chemical reaction is to change :

(A) Heat of reaction **(B)** Products of reaction

(C) Activation energy **(D)** Equilibrium constant

12. Decomposition of NH_3 on the surface of tungsten is a reaction of :

(A) zero order **(B)** first order

(C) second order **(D)** fractional order.

13. The ionic reactions are usually very fast because :

(A) The energy of interaction between charged ions is greater than that between neutral molecules

(B) it does not involve bond breaking

(C) the number of collisions between ions per unit volume per second are very large

(D) these reactions are highly exothermic

14. Which of the following explains the fact that the reactions of high molecularity are rare?

(A) The more the number of colliding particles, the more is their weight and difficult it becomes to cross the barrier

(B) The activation energy for many-body collisions becomes very large

(C) Many-body collisions have low probability

(D) Many body collisions are not energetically favoured

15. On increasing the temperature by 10K, the rate of reaction becomes double. Which of the following is the most appropriate reason?

(A) With increase of temperature, velocities increase and hence the number of collisions are appreciably increased

(B) The activation energy decreases with increase of temperature

(C) The bonds between the atoms of the reacting molecules become weak at higher temperatures

(D) The higher the temperature, large is the fraction of colliding particles which can cross the energy barrier