Gaining Apex Coaching Centre

(Where Toppers make…… Toppers)

DPP

DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : CHEMISTRY**

Date : **DPP No. : 3**

Topic :- Chemical Kinetics

1. The rate constants k_1 and k_2 for two different reactions are $10^{16}e^{-2000/T}$ and $10^{15}e^{-1000/T}$, respectively. The temperature at which $k_1 = k_2$ is:
   a) $\frac{2000}{2.303}$ K b) 2000 K c) $\frac{1000}{2.303}$ K d) 1000 K

2. If the volume of the vessel in which the reaction $2NO + O_2 \rightarrow 2NO_2$ is occurring is diminished to $1/3^{rd}$ of its initial volume. The rate of the reaction will be increased by
   a) 3 times b) 9 times c) 27 times d) 36 times

3. The time for half-life period of a creation reaction $A \rightarrow$products is 1 h. when the initial concentration of the reactant 'A', is 2.0 $mol\ L^{-1}$, how much time does it take for its concentration to come from 0.50 to 0.25 $mol\ L^{-1}$, if it is a zero order reaction?
   a) 4 h b) 0.5 h c) 0.25 h d) 1 h

4. For a reaction $A + B \rightarrow C + D$, if the concentration of A is doubled without altering the concentration of B, the rate gets doubled. If the concentration of B is increased by nine times without altering the concentration of A, the rate gets tripled. The order of the reaction is
   a) 2 b) 1 c) 3/2 d) 4/3

5. What fraction of a reactant showing first order remains after 40 minute if $t_{1/2}$ is 20 minute?
   a) 1/4 b) 1/2 c) 1/8 d) 1/6

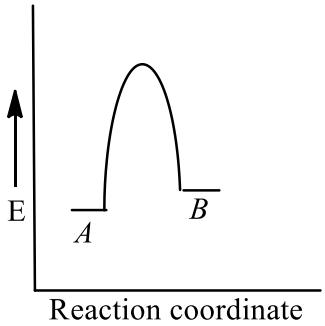
6. At 500 k, the half-life period of a gaseous reaction at an initial pressure of 80 kPa is 350 s. when the pressure is 40 kPa, the half-life period is 175 s. The order of the reaction is
   a) Zero b) One c) Two d) Three

7. Which of the following statements are incorrect?
   a) Rate of the reaction involving conversion of $ortho$ hydrogen to $para$ hydrogen $= -\frac{d[H_2]}{dt} = k[H_2]^{3/2}$

b) Rate of the reaction involving the thermal decomposition of acetaldehyde $= k[CH_3CHO]^{1/2}$
c) In the formation of phosgene from CO and Cl_2, the rate of the reaction $= k[CO][Cl_2]^{1/2}$
d) In the decomposition of H_2O_2, the rate of reaction $= k[H_2O_2]$

8. At 373 K, a gaseous reaction $A \rightarrow 2B + C$ is found to be of first order. Starting with pure A, the total pressure at the end of 10 min was 176 mm and after a long time when A was completely dissociated, it was 270 mm. The pressure of A at the end of 10 min was
a) 94 mm b) 47 mm c) 43 mm d) 90 mm

9. For a reversible reaction, $A \rightleftharpoons B$, which one of the following statements is wrong from the given energy profile diagram?



a) Activation energy of forward reaction is greater than backward reaction
b) The forward reaction is endothermic
c) The threshold energy is less than that of activation energy
d) The energy of activation of forward reaction is equal to the sum of heat of reaction and the energy of activation of backward reaction

10. Which one of the following is wrongly matched?
a) Saponification of $CH_3COOC_2H_5$ -second order reaction
b) Hydrolysis of CH_3COOCH_3 -pseudo unimolecular
c) Decomposition of H_2O_2 -first order reaction
d) Combination of H_2 *and* Br_2 to give HBr -first order reaction

11. For the reaction,
$2N_2O_5(g) \rightarrow 4NO_2(g) + O_2(g)$
If the concentration of NO_2 increase by $5.2 \times 10^{-3}M$ in 100 s then the rate of the reactions
a) $1.3 \times 10^{-5}Ms^{-1}$ b) $0.5 \times 10^{-4}Ms^{-1}$ c) $7.6 \times 10^{-4}Ms^{-1}$ d) $2 \times 10^{-3}Ms^{-1}$

12. The rate of the reaction $A \rightarrow$ product, at the initial concentration of $3.24 \times 10^{-2}M$ is nine times its rate at another initial concentration of $1.2 \times 10^{-3}M$. The order of the reaction is
a) $\frac{1}{2}$ b) $\frac{3}{4}$ c) $\frac{3}{2}$ d) $\frac{2}{3}$

13. The half-life period for zero order reaction $A \rightarrow$ product, is 100 min. How long will it take in 80% completion?
    a) 80 min b) 160 min c) 100 min d) 200 min

14. Consider the reaction $2A + B \rightarrow product$
    When concentration of B alone was doubled, the half-life did not change. When the concentration of A alone was doubled, the rate increased by two times. The unit of rate constant for this reaction is
    a) $L\ mol^{-1}s^{-1}$ b) No unit c) $mol\ L^{-1}s^{-1}$ d) s^{-1}

15. The expression for rate constant of a first order chemical reaction is
    a) $k = \frac{1}{t} \cdot \frac{x}{a(a-x)}$ b) $k = \frac{2.303}{t} \log_{10} \frac{a}{(a-x)}$
    c) $k = \frac{x}{t}$ d) $k = \frac{1}{2t}\left[\frac{1}{(a-x)^2} - \frac{1}{a^2}\right]$

16. In gaseous reactions important for the understanding of the upper atmosphere H_2O and O react bimolecularly to form two OH radicals. ΔH for this reaction is 72kJ at 500 K and E_a is 77 kJ mol^{-1}, then E_a for the bimolecular recombination of two OH radicals to form H_2O and O is:
    a) 3 kJ mol^{-1} b) 4 kJ mol^{-1} c) 5 kJ mol^{-1} d) 7 kJ mol^{-1}

17. Activation energy of a reaction
    a) Is independent of temperature
    b) Increases with temperature
    c) Gets doubled for every 10 degree rise in temperature
    d) Decreases with temperature

18. For a I order reaction $A \longrightarrow B$ the reaction rate at reactant concentration $0.01M$ is found to be $2.0 \times 10^{-5}\ Ms^{-1}$. The half-life period of the reaction is:
    a) 30s b) 300s c) 220s d) 347s

19. For a zero order reaction, the plot of concentration of reactant vs time is (intercept refers to concentration axis)
    a) Liner with positive slope and zero intercept
    b) Linear with negative slope and zero intercept
    c) Linear with negative slope and non-zero intercept
    d) Linear with positive slope and non-zero intercept

20. The rate of reaction between two reactants A and B decreases by a factor 4, if the concentration of reactant B is doubled. The order of this reaction with respect to B is:
    a) -1 b) -2 c) 2 d) 1