THE GURUKUL INSTITUTE

PLOT 5C, 2ND FLOOR, GANAPATI COMPLEX, SEC-13, OPP. JAIPURIA SCHOOL, VASUNDHARA, GHAZIABAD (U.P)

GURUKUL QUIZ – 3

CHEMICAL KINETICS

1. The decomposition of a substance follows first order kinetics. Its concentration is reduced to 1/8th of the initial value in 24 minutes. The Rate constant of the reaction is……?
2. If the concentration of reactants is increased by 'x' , then the k becomes
   a) ln (k/x) b) k/x c) k + x d) k
3. What is the value of decay constant of a compound having half – life as 2.95 days?
4. The half – life of a reaction is halved as the initial concentration of the reaction is double. The order of the reaction is :
   a) 0.4 b) 1 c) 2 d) 0
5. Minimum energy of activation of an exothermic reaction is
   a) Zero b) negative c) positive d) None of these.
6. In a first order reaction, 75% disappeared in 1.386 hours. Calculate rate constant of the reaction?
7. For a given reaction, $t_{1/2} = 1/k_a$, the order of the reaction is :
   a) 0 b) 1 c) 2 d) 3
8. Half – life of the reaction is found to be inversely proportional to the cube of initial concentration. The order of the reaction is:
   a) 2 b) 3 c) 4 d) 5
9. The reaction : $2N_2O_5 \rightleftharpoons 2\ N_2O_4 + O_2$ is
   a) Bimolecular & second order c) Unimolecular & first
   b) Bimolecular & first order d) Bimolecular & Zero order
10. For first order reaction $t_{0.75}$ is 138.6 seconds. Its specific reaction rate is :
    a) 10^{-2} b) 10^{-4} c) 10^{-5} d) 10^{-6}
11. For a first – order reaction, the ratio for the completion of 99.9% and half of the reaction is :
    a) 8 b) 10 c) 9 d) 12
12. For the first order reaction, A → 2B + C, the initial pressure is P_A = 90 mm Hg, the pressure after 10 min, is found to be 180 mm Hg. The rate constant is…….?
13. For a second order reaction of type***, rate = k $[A]^2$, the plot of $1/[A]_t$ versus t is linear with :
    a) Positive slope and zero intercept
    b) Positive slope and non- zero intercept
    c) Negative slope and zero intercept
    d) Negative slope and non- zero intercept
14. The hydrolysis of ester was carried out with 0.05 M HCl and 0.05M H_2SO_4. Which of the following is true:
    a) $K_{HCl} > K_{H_2SO_4}$ b) $K_{HCl} < K_{H_2SO_4}$ c) $K_{HCl} = K_{H_2SO_4}$ d) $K_{H_2SO_4} = 2\ K_{HCl}$
15. The activation energy for a reaction which doubles the rate when the temperature is raised from 300K to 310K:
    a) 50.6 kJ/ mol b) 53.6 kJ/mol c) 56.6 kJ/mol d) 59.6 kJ/mol
16. The catalyst decreases the E_a from 100 kJ/mol to 80 kJ/mol. At what temperature the rate of reaction in the absence of catalyst at 500 K will be equal to the rate of reaction in presence of catalyst?
17. A reaction takes place in three steps with K_1, K_2 and K_3 as rate constants. The overall rate constant is K = $\frac{k_1(k_2)^{1/2}}{k_3}$. If activation energies are 40, 30 and 20 kJ for step I, II and III respectively. The overall activation energy of the reaction is
    a) 10 b) 15 c) 30 d) 35
18. For a first order reaction, when log k was plotted against 1/T, a straight line with a slope of 6000 was obtained. Calculate the Activation energy for the reaction?
19. The rate of combination of free radicals:

a) Increase with increase in temperature
b) Decrease with increase in temperature
c) Depends upon temperature
d) Different for different reactions

20. A consecutive reaction,

$$P \xrightarrow{K_1} Q \xrightarrow{K_2} R$$ leads to:

a) Maxima in [P] if $K_1 > K_2$
b) Maxima in [Q] if $K_1 > K_2$
c) Maxima in [Q] if $K_1 < K_2$
d) Maxima in [P] if $K_1 < K_2$

21. The rate constant of three reactions involving reactant A only obeying I, II, III respectively is same. Which of the following is true:

a) $r_3 > r_2 > r_1$ if [A] > 1
b) $r_1 > r_2 > r_3$ if [A] < 1
c) $r_1 = r_2 = r_3$ if [A] = 1
d) all of these

22. The temperature coefficients of two reactions are 2 and 3 respectively. Which would be correct?

a) $E_{a_1} < E_{a_2}$ b) $E_{a_1} > E_{a_2}$ c) $E_{a_1} = E_{a_2}$ d) None of these

23. The half – life period of a compound is 50 min. If the initial concentration is halved, the half life becomes 25 min. The order of the reaction is …….

24. A first order gaseous reaction has k = 1.5 x 10^{-6} sec^{-1} at 200°C. If the reaction is allowed to run for 10 hours, what % of initial concentration would have changed into products?

25. A substance A is mixed with equal quantities of B and C. At what fraction of A will left un reacted t the end of 2000 seconds, assuming first order?