Chemical kinetics

2 & 3 marks

No.1 prove that for a 1st order reaction the time taken for 99% completion of the reaction is twice the time required for the completion of 90% of the reaⁿ.

No.2 A 1st order reaⁿ take place 69.3 min. for 50% completion. How much time will be needed for 80%?

No.3 In a 1st order reaction, the reactant concentration decreases from 0.8 m to 0.4 m in 15 min. what is the time taken for conc to change 0.1 m to 0.025 m?

No.4 what is the difference betⁿ order and molecularity of the reaⁿ?

No.5 what is molecularity? Explain with examples?

No.6 Explain, why the rate of reaⁿ decreases as reaⁿ proceed.

No.7 for a 1st order reaction it takes 16 min to complete 50% reaⁿ. How much time does it takes to complete 75% reaⁿ?

No.8 calculate the rate constant of a reaⁿ (1st order) which is 90% complete in 10 min?

No.9 what is zero order reaⁿ?

No.10 Name any two factors that influence the rate of a reaⁿ.

No.11 Prove that the time required for completion of 99.9% of 1st order reaⁿ is 10 times the time required for 50% completion of the reaⁿ.

No. 12 Prove that for a 1st order reaⁿ, the time required for completion of 99.9 % of reaⁿ is three times the time required for completion of 90% of the reaⁿ.

No. 13 Show that the time required for completion of 99.9 % of a 1st order reaⁿ is five times the time required for completion of 75 % of the reaⁿ.

No. 14 A 1st order reaⁿ is 25 % complete in 30 min. Calculate it's half life period.

No. 15 The rate of reaⁿ is doubled when the temp. rises from 27°C to 37°C. Calculate the activation energy for such reaⁿ.

No. 16 Define temperature coefficient.

No. 17 Derive half-life period from the 1st order rate equation.

No. 18

Name the factors that influence the rate of rean?

No. 19

In the rean $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$ the rate of formation of NO is 3.6×10^{-3} mol l^{-1} sec^{-1}. Calculate the rate of disappearance of O_2 gas.

No. 20

In certain rean, the reactants posses energy more than threshold energy yet the rean is slow explain.

No. 21

A rean is second order w.r.t reactant 'A' in the rean $2A \rightarrow P$. How the rate of rean will vary if the conc. of reactant is doubled.

No. 22

Define threshold energy. How is it related to activation energy?

No. 23 How the catalyst affect the rate of chemical reaⁿ.

No. 24 calculate the half life period of a 1st order reaⁿ having rate const. of 10^{-2} sec^{-1}.

No. 25 Distinguish betⁿ rate of reaⁿ & rate constant.

No. 26 Define order of a reaⁿ.

No. 27. for the reaⁿ $N_2 + 3H_2 \longrightarrow 2NH_3$. The rate of disappearance of H_2 is 0.18 m sec^{-1}. find the rate of dissappearance of N_2 & the rate of formation of NH_3.

No. 28 The half life period of a 1st order reaⁿ is 2 min. How long will it take to reach 1/4th of initial conc. of the reactant.

No. 29 Derive an equation for half life period of a zero order rea^n.

No. 30 what is the difference bet^n avg. & instantaneous rate of rea^n?

No. 31 why average rate of rea^n is not ~~equal~~ the actual rate of rea^n?

No. 32 for the 75% of 1st order rea^n is completed in 16 min. what is its half life period.

No. 33 Derive Arrhenius equation.

No. 34 A 1st order rea^n is 20% completed in 10 min. calculate the specific rea^n rate of the rea^n & taken for 75% completion.

No. 35 on the basis of the Ea how can you show slow and fast rea^n?

No. 36 How is the rate of reaⁿ related to the conc. of the reactant?

No. 37 Calculate the "Ea" of reaⁿ whose reaⁿ rate at 300K gets doubled for 10°C rise in temp.

No. 38 Explain the collision theory.

No. 39 What is the order of the reaⁿ given below

$$N_2O_5 \longrightarrow 2NO_2 + \frac{1}{2}O_2$$

No. 40 What is activation energy?

long types (5 marks)

No. 1 Discuss the factors that influence on the rate of reaⁿ?

No. 2

a) Explain the term molecularity & order of reaⁿ. Give with suitable example.

b) write it's difference.

No. 3 Define order & molecularity of a reaⁿ. Derive expression for the rate constant of a 1st order reaⁿ.

No. 4 ~~Define~~ write difference betⁿ order & molecularity of the reaⁿ. Derive expression for the rate constant of a zero order reaⁿ.

No:5 Explain the following

a) Activation energy

b) Arrhenius theory

c) Corrosion theory.