Chemical Kinetics

1. State the difference between order and molecularity of a reaction.
2. Show that the half life period of a second order reaction is inversely proportional to the initial concentration of the reactant when both reactants are same.
3. When the initial concentration is changed from 0.5 to 1.0 mole.litre^{-1}; the time of half completion for a   certain reaction is found to change from 50 to 25 seconds. Calculate the time taken for the concentration to be reduced to 20% of the initial value. Can you say reaction will complete in finite time or not?
4. What is pseudo-unimolecular reaction? Give one example.
5. Deduce the expression for the rate constant of a first order reaction. Show that half-life period of a first order reaction is independent of the initial concentration.
6. What are the basic postulates of transition state theory?
7. Write down the Arrhenius equation for the temperature dependence of specific rate and explain the terms used.
8. The activation energy of a reaction is 22.5 K cal/mol and the value of rate constant is 313 K is 1.8x10^{-5}. What is the frequency factor of such a reaction?
9. Show that the half life period of a first order reaction is independent to the initial concentration of the reactant.
10. Find out the rate constant for second order reaction i) when initial concentration is same. ii) When initial concentration is same.
11. Write short notes on activation theory and collision theory.
12. Find relation between half life and concentration for any reaction.
13. What is catalysis? Derive the kinetic expression of 'homogeneous catalysis' with example.
14. Calculate the activation energy of a reaction whose rate constant is doubled when temperature is increased from 200 K to 300 K.
15. The half-life period of the decomposition of a compound is 5 min. If the initial concentration is halved, the half life period is reduced to 25 min. Find the order of reaction.