

# Integral University, Lucknow

## Department of Chemistry

B.Sc. (Hons.) Industrial Chemistry, I Year/ II Semester

Physical Chemistry-II (CH-108)

### Assignment-I

S. No.	Enrolment No.	Name	Questions
1.	1600102147	AAINAB RIZVI	<ol style="list-style-type: none"><li>1. Differentiate between order of reaction and molecularity.</li><li>2. 60 % of a first order reaction was completed in 60 minutes. When was it half completed?</li><li>3. Define a second order reaction and derive an integrated rate equation for it.</li><li>4. Explain why entropy of a perfectly crystalline substance is less than that of its imperfect crystals?</li><li>5. Derive an expression for the calculation of the entropy change of an ideal gas when the temperature changes from <math>T_1</math> to <math>T_2</math> and the pressure changes from <math>V_1</math> to <math>V_2</math>.</li></ol>
2.	1600102446	DIGVIJAY CHAUDHARY	
3.	1600102032	LAIBA RUKHSAR	
4.	1600102105	MOHAMMAD IMRAN	
5.	1600100271	MOHD ATIF KHAN	<ol style="list-style-type: none"><li>1. Define pseudo-unimolecular reactions with suitable examples.</li><li>2. The rate of formation of a dimer in a second order dimerisation reaction is <math>9.5 \times 10^{-5} \text{ mol L}^{-1} \text{ s}^{-1}</math> at <math>0.01 \text{ mol L}^{-1}</math> monomer concentration. Calculate the rate constant.</li><li>3. What do you understand by the rate law and the rate constant of a reaction? Derive the units of rate constant for the reactions of various orders.</li><li>4. What will happen to entropy when: (i) Sugar dissolves in water</li></ol>
6.	1600103196	ERAM JAMAL SIDDIQUI	
7.	1600101161	MOHD SHAHBAJ KHAN	

			(ii) Water freezes to form ice (iii) Stretched rubber band to loose rubber band
8.	1600101275	NOORUDDIN	5. Derive an expression for the calculation of the entropy change of an ideal gas when the temperature changes from $T_1$ to $T_2$ and the pressure changes from $P_1$ to $P_2$ .
9.	1600101409	ABDUL KAREEM	1. Define pseudo-unimolecular reactions and give an example.
10.	1600101594	ANKIT RAI	2. Calculate the half life period of a first order reaction when the rate constant is $5 \text{ years}^{-1}$ .
11.	1600103048	AISHA TASNEEM	3. Define a first order reaction and derive an integrated rate equation for it. How would you represent a first order reaction graphically?
12.	1600100123	MOHD AFZAL	4. The enthalpy change for the reaction of liquid water to steam, $\Delta H_{\text{vap}}$ is $40.8 \text{ kJ mol}^{-1}$ at 373 K. Calculate entropy change for the process.
13.	1600101941	ZAARA ASHRAF	5. What is second law of thermodynamics? Also give various statements of second law of thermodynamics.
14.	1600100823	ZAID ALAM	1. What do you understand by rate determining step?
15.	1600100514	WAJIHUDDIN	2. What is half-life time? Explain it for first and second order reactions.
16.	1600100688	SUFIA AHSAN	3. In the Arrhenius equation for a certain reaction, the values of A and $E_a$ are $4 \times 10^{13} \text{ s}^{-1}$ and $98.6 \text{ kJ mol}^{-1}$ respectively. If the reaction is of first order, at what temperature will its half-life period be 10 min?
17.	1600100065	MD KABISH	4. Explain spontaneous and non-spontaneous processes. 5. One mole of helium gas is heated from a temperature of 300 K to 600 K. Calculate the entropy change if (a) Volume is kept constant (b) Pressure is kept constant Assume that helium behaves like an ideal gas and $C_v = 1.5 R$