

DEPARTMENT OF CHEMISTRY
FACULTY OF SCIENCE & HUMANITIES
SRM UNIVERSITY
KATTANKULATHUR

LESSON PLAN
Academic year 2016 – 17

Program : II B.Sc. Chemistry
 Subject Title : Concepts in Physical Chemistry
 Subject Code : UCY15402

Total No. of Hours: 45
 Semester : IV

UNIT No.& Title	TOPICS	LECTURE NO.	REFERENCE BOOKS
I. CHEMICAL KINETICS	Rate of a reaction – order and molecularity	1	1. B.R. Puri, L.R. Sharma and M.S. Pathania (2008): Principles of Physical Chemistry, 42 nd Edition, Vishal Publishing Company. 2. P.W. Atkins, (1998): Physical Chemistry, 6 th Edition, Freeman.
	Derivation of rate constant for first and second order reactions	2	
	Derivation of rate constant for zero order reaction	3	
	Derivation of rate constant for pseudo first order reaction	4	
	Hydrolysis of ethyl acetate, saponification of esters –	5	
	Methods of determining order of a reaction, half-life time method	6	
	Effect of temperature on reaction rates	7	
	Concept of activation energy – Arrhenius equation	8	
	Collision theory	9	
II. COLLIGATIVE PROPERTIES OF DILUTE SOLUTIONS	Solution- dilute solutions-definition - Raoult's law for vapour pressure lowering (equation only)	10	1. B. R. Puri, L. R. Sharma and M. S. Pathania (2008): Principles of Physical Chemistry, 42 nd Edition, Vishal Publishing Company. 2. Gilbert. W. Castellan, (1998): Physical Chemistry, Addison-Wesley Publishing Company. London.
	Van't Hoff equation (no derivation)	11	
	Determination of molar mass from osmotic pressure measurement	12	
	Reverse osmosis	13	
	Boiling point elevation derivation of molal elevation constant (K _b)	14	
	determination of molar mass from boiling point elevation	15	
	Freezing point depression	16	
	Determination of molar mass from freezing point depression	17	
	Solving related problems	18	
III. CHEMICAL EQUILIBRIUM AND THERMODYNAMICS	Law of mass action- thermodynamic treatment of the law of mass action	19	1. B. R. Puri, L. R. Sharma and M. S. Pathania (2008): Principles of Physical Chemistry, 42 nd Edition, Vishal Publishing Company.
	Van't Hoff reaction isotherm	20	
	Temperature dependence of the equilibrium constant -relationship between K _p and K _c	21	
	Homogeneous equilibria - dissociation of PCl ₅	22	
	Factors affecting chemical equilibrium - Le-chatlier principle	23	
	Zerorth and Third law of Thermodynamics	24	

	Zeroth law of thermodynamics – absolute temperature scale	25	2. Glasstone S., Lewis D(1976): Textbook of Physical Chemistry, McMillan & Co. Ltd, London.
	Statement of third law - Nernst heat theorem	26	
	Solving related problems	27	
IV. SOLUTIONS OF NON-ELECTROLYTES	Solution of liquids in liquids - Raoult's law	28	1. B.R. Puri, L.R. Sharma and M.S. Pathania (2008): Principles of Physical Chemistry, 42 nd Edition, Vishal Publishing Company. 2. Gilbert.W.Castellan, (1998): Physical Chemistry, Addison-Wesley Publishing Company, London.
	Chemical potentials of ideal and non-ideal solutions	29	
	Gibbs–Duhem – Margules equation	30	
	Fractional distillation of binary liquid systems	31	
	Azeotropic mixture – steam distillation of immiscible liquids	32	
	Solubility of partially miscible liquids	33	
	Phenol-Water system	34	
	Effect of impurities on critical solution temperature	35	
	Henry's law – applications of Henry's law	36	
	Catalysis: General characteristics	37	
V. SURFACE PHENOMENA	Types of catalysis – acid base catalysis- explanation with suitable examples	38	1. B.R. Puri, L.R. Sharma and M.S. Pathania (2008): Principles of Physical Chemistry, 42 nd Edition, Vishal Publishing Company. 2. P.W. Atkins.(1998): Physical Chemistry, 6 th Edition, Freeman.
	Enzyme catalysis - explanation with suitable examples	39	
	Michaelis–Menten equation - derivation	40	
	Adsorption: Definition – difference between adsorption and absorption	41	
	Factors influencing adsorption	42	
	Langmuir adsorption isotherm – applications	43	
	Freundlich adsorption isotherm – applications	44	
	Revising the portions and discussing the previous year university question papers.	45	

STAFF DETAILS

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