



बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsā Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Science

B.Sc. (Chemistry) Programme

Subject Code & Name: - BS05MICHE1 & Physical Chemistry-I

Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
				CCE		SEE	
L	T	P	Total	TH	PWE	TH	PWE
2	-	2	4	25	25	25	25

Programme Name	B.Sc.
Semester	V
Course Code	BS05MICHE1
Course Title	Physical Chemistry-I
Course Content Type (Th./Pr.)	Theory & Practical
Course Credit	4
Sessions+ Lab. Per Week	4
Total Teaching/Lab. Hours	60 Hours
* 2 Laboratory = 1 Session	

Learning Objectives

1. The learning objectives of thermochemistry focus on understanding energy changes during chemical and physical processes,
2. distinguishing between endothermic and exothermic reactions,
3. Applying Hess's Law to determine enthalpy, and calculating heat transfer using calorimetric. Students also learn to differentiate between system and surroundings, heat and temperature, and calculate bond enthalpies.
4. Whereas the study of chemical kinetics focus on understanding the speed of chemical reactions and the factors influencing them, including reactant concentration, temperature, and catalysts.
5. Students learn to define reaction rates, determine rate laws and reaction orders (zero, first, second), apply integrated rate laws to solve problems,
6. Calculate half-lives, and interpret Arrhenius equation concepts regarding activation energy.

Prerequisites (if any)





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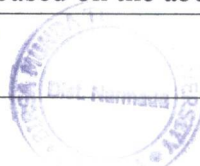
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Learning Outcomes

1. Thermochemistry helps you understand how heat is absorbed or released during chemical reactions (endothermic and exothermic).
2. You learn to calculate energy changes using Enthalpy and apply Hess's Law.
3. It also teaches how to measure heat using calorimetric. Overall,
4. It explains energy changes in reactions based on the First Law of Thermodynamics.
5. Chemical kinetics helps you understand how fast chemical reactions occur and how reaction rates are measured.
6. It explains the factors that affect reaction speed, such as temperature, concentration, and catalysts. You also learn how to write rate laws and determine the order of reactions. Additionally,
7. It helps in understanding reaction mechanisms and real-life applications of reaction rates.

Detailed Contents

UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	Thermochemistry Introduction , Change of Internal Energy In a Chemical Reaction , Change Of Enthalpy In a Chemical Reaction, Exothermic And Endothermic Reaction, Relation Between Enthalpy of reaction at constant volume and constant pressure , standard enthalpies of reaction, combustion and neutralization enthalpy of solution, enthalpy of hydration, standard enthalpy of formation, determination of enthalpy of reaction , various of enthalpy of a reaction with temperature, the Kirchhoff's reaction , Hess's law of constant heat Summation, application of Hess's law, measuring of enthalpy of combustion, bond energy and application of bond energies, Numericals.	15
II	Chemical kinetics Introduction, Rates of reaction, The rate and rate constant, Measuring rate of reaction, Expressing rate of reaction, Factor affecting rate of reaction, Order of reaction, Zero order reaction First order reaction, Second order reaction, Half lifetime, Pseudo order reaction, Methods of determining order of reaction, Molecularity of reaction, Numerical based on the above topics.	15





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Text Book(s)

1.

Reference Books

1. Essentials of Physical Chemistry, B. S. Bahl, G. D. Tuli and Arun Bahl, S. Chand & Co.
2. Physical Chemistry, 7th edition P. C. Rakshit
3. Elements of Physical Chemistry, B. R. Puri, L. R. Sharma and Madan Pathania, Vishal Publishing Co. Jalandhar.
4. Physical Chemistry, Gordon M. Barrow
5. A Textbook of physical chemistry, O.P.Tadon, 1st edition
6. Advanced Physical chemistry Vol-1, Gutru & Gutru, 3rd edition
7. Advanced Physical chemistry Vol-2, Gutru & Gutru, 3rd edition
8. Physical Chemistry, W.J. Moore, 6/E, 1996, Mac-Graw Hill Publication
9. Essentials of Physical Chemistry, Bahl & Tuli, 22/E, S. Chand Publication, New Delhi.
10. Advanced Physical Chemistry by Gurdeep Raj, 19/E, Goel Publishing House Meerut.

Web Resources

1. Google books, INFLIBNET, Google Web

Required Software(s) (if any)

Practical(s) (if any)

Chemical kinetics

1. Reaction of between $K_2S_2O_8$ & KI ($a=b$)
2. Reaction of between $KBrO_3$ & KI ($a \neq b$)
3. Reaction of between H_2O_2 & KI ($a=b$) and other chemical kinetics practical's for determination of order of reactions

30

L:: Lecture, **T::** Tutorial, **P::** Practical

CCE:: Continuous and Comprehensive Evaluation

(CCE Theory includes Mid Semester Examination, Assignment, MCQ quizzes, Seminar, Reflective notes, class participation, case analysis and presentation, slip tests (announced/surprised), attendance etc. or any combination of these)

PWE:: Practical Work Examination

(PWE includes Laboratory practical work, project work, viva simulation exercise work etc.)

SEE:: Semester End Evaluation

