



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: - BS03MJCHE2 Inorganic Chemistry-I

Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage (%)			
				CCE		SEE	
L	T	P	Total	TH	PWE	TH	PWE
3	-	1	4	35	15	35	15

Programme Name	B.Sc.
Semester	III
Course Code	BS03MJCHE2
Course Title	Inorganic Chemistry-I
Course Content Type (Th./Pr.)	Theory & Practical
Course Credit	3 + 1
Sessions+ Lab. Per Week	3 +2
Total Teaching/Lab. Hours	45 Theory Hours + 30 Practical Hours
* 2 Laboratory = 1 Session	

Learning Objectives

1. Understanding their electronic configurations, periodic trends and properties.
2. Be able to explain trends in atomic radii, ionization energies and electronegativity across and down the p-block and d-block elements
3. Understand the properties of transition elements, including their catalytic activity, formation of complex compounds and colored ions.
4. Know the uses of inner transition elements in nuclear energy, medicine and various industrial processes.
5. Understand the properties of inner transition elements including their radioactivity, variable oxidation states, and complex forming behavior.

Prerequisites (if any)

Learning Outcomes

On the Completion of this course, students will able to:

1. Students should be able to explain how p-block elements have their outermost valence electrons in the p-orbitals.





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- Students should be able to discuss trends in properties like electronegativity, ionization energy and atomic radius within the p-block
- They should understand the general characteristics of transition elements such as their ability to form colored ions and complexes, their variable oxidation states and their catalytic properties.
- Students should be able to explain the tendency of transition elements to form complexes including factors like the availability of d-orbitals and the nature of ligands.
- They should understand the concept of lanthanide contraction and its consequences on the atomic radii and ionic radii of subsequent elements as well as the effect on other properties like density and melting points
- They should be able to explain the reasons for the colored ions of inner transition elements.

Detailed Contents		
UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	Chemistry of p-block elements (Group-15, 16, 17 & 18) <ul style="list-style-type: none">➤ Occurrence of group 15, 16 and 17 elements and compounds of inert gas elements,➤ Physical and chemical properties, Preparation, Properties and uses of some compounds of p-block elements (like: nitrogen, ammonia, phosphine, chlorine, phosphorous trichloride, phosphorous pentachloride, sulfur dioxide, sulfuric acid), study of oxides and oxoacids of these group elements,➤ Chemical Preparation and properties of xenon fluoride compounds and uses of Nobel gases.	15
II	Transition Elements <ul style="list-style-type: none">➤ Position In the Periodic Table,➤ Electronic Configurations of d-Block Elements,➤ General Physical Properties of d-Block Elements,➤ Oxidation States, Different Trends In the Standard Electrode Potentials,➤ Stability Study of Higher Oxidation States,➤ Magnetic Properties, Formation of Color Ions,➤ Catalytic Properties, Study of Interstitial Compounds,➤ Alloy Formation,➤ Oxides and Oxo-anions of Metals➤ Application of Transition Metal	15





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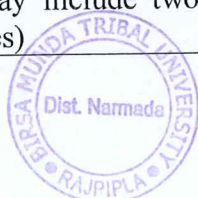
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III	<p>Lanthanides-Actinides</p> <p>Lanthanides:</p> <ul style="list-style-type: none"> ➤ Position of lanthanides in periodic table, ➤ General properties, Electronic configuration, Oxidation state and oxidation potential chemistry of different oxidation states, ➤ Atomic and ionic radii, ➤ Lanthanide Contraction, ➤ Cause of lanthanide contraction, ➤ Properties of lanthanides, Magnetic properties, ➤ Separation method of lanthanides: Fractional precipitation, complex formation and solvent extraction, ➤ Chemical properties of lanthanides, Complex formation ability, ➤ Color And Spectra, ➤ Shift Reagent <p>Actinides:</p> <ul style="list-style-type: none"> ➤ Position of actinides in periodic table, ➤ Electronic configurations, ➤ Comparison of lanthanides and actinides, oxidation states, atomic radii and ionic radii, ➤ Magnetic properties, ➤ Complex formation ability, ➤ Color and absorption spectra ➤ Application of Transition f-block elements 	15
Text Book(s)		
Reference Books		
<ol style="list-style-type: none"> 1. Basic Inorganic Chemistry – Gurdeep & Chatwal. 2. Inorganic Chemistry - J. N. Gurtu & H. C. Khera 3. Advanced Inorganic Chemistry- Cotton and Wilkinson 4. Principles of Inorganic chemistry- B. R. Puri, L. R. Sharma and K. C. Kalia; Vallabh publications, Delhi. 5. Concise Inorganic Chemistry - J. D. Lee 		
Web Resources		
Required Software(s) (if any)		
Practical(s) (if any)		
Inorganic Mixture: Four radicals, It may include two positive radicals and two negative radicals. (At least Eight mixtures)		30





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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

