

Government P G College, Ambala Cantt
Course File (Session 2023-24)
Name of Associate Professor: Dr. Deepak Sharma
Class: BSC-II/4th Semester/Non Medical and Medical
Paper code and Name: CHE-204/ Inorganic Chemistry

SYLLABUS

Maximum Marks: 33 (External)
08 (Internal)

Time: 3 hours

Note: Nine questions will be set. Q. No. 1 based on whole syllabus, is compulsory. There will be four questions from section A and four from section B. The candidate is required to attempt five questions in all selecting two questions from each section.

SECTION-A

Chemistry of f-Block elements

Lanthanides

Lanthanides: Electronic structure oxidation states, magnetic properties, complex formation, colour, ionic radii and lanthanide contraction occurrence, separation of lanthanides, Lanthanide compounds

Actinides

General characteristics of actinides, chemistry of separation of Np, Pu and Am from uranium, Transuranic elements, comparison of properties of Lanthanides and actinides with transition elements

SECTION-B

Theory of Qualitative and Quantitative Inorganic Analysis

Common ion effect, solubility product, theory of Qualitative and Quantitative Analysis
Chemistry of analysis of various groups of basic radicals and acid radicals, chemistry of identification of acid radicals in typical combination, chemistry of interference of acid radicals including their removal in the analysis of basic radicals, theory of precipitation, co-precipitation, post precipitation, purification of precipitates.

Text Books:

1. Jauhar, S.P.; Modern Approach to Inorganic Chemistry, Vol II, Modern Publishers
2. Bhasin, K.K.; Pradeep's Inorganic Chemistry, Vol II, Pradeep Publications

Reference Books:

1. Lee, J.D.; (2010), Concise Inorganic Chemistry, Wiley India.
2. Huheey, J.E.; Keiter, E.A.; Keiter; R. L.; Medhi, O.K. (2009), Inorganic Chemistry- Principles of Structure and Reactivity, Pearson Education.

COURSE OBJECTIVES

The Course Objectives are given below

- To have knowledge regarding the position of f-block elements.
- To study the properties of lanthanide compounds
- To have better understanding regarding the comparison of characteristics of lanthanides and actinides
- To have better understanding regarding the comparison of transition elements with inner transition elements in reference to ionic radii, oxidation state, magnetic and spectral properties, complex formation tendency.
- To study the chemistry of separation of actinides
- To know about the nuclear reaction and synthesis of transuranic elements.
- To have better understanding of precipitation from solution phase.
- To have the knowledge of gravimetry.
- To have awareness regarding the various problems that might occur while qualitative analysis of radicals.

COURSE OUTCOMES

After the successful completion of the course, students will be able:

- To distinct various transition elements from inner transition elements.
- To understand and can differentiate characteristics of actinides, lanthanides.
- To understand the various characteristics of nuclear reactions.
- To understand and can justify the applicability of common ion effect and solubility product in precipitation reaction.
- To justify the grouping of basic radicals depending upon the knowledge of common ion effect and solubility product.
- To form the combination of various acid and basic radicals.
- To understand the wide applicability of lanthanides in various fields such as catalysis, liquid laser, magnetic and electronic devices etc.
- To understand the various methods of separation of lanthanides from each other.

LESSON PLAN

Week No	Scheduled Dates	Topics to be covered
1	Jan 05, 2024 Jan 06, 2024	Lanthanides: Electronic structure oxidation states, magnetic properties, complex formation
2	Jan 12, 2024 Jan 13, 2024	colour, ionic radii and lanthanide contraction occurrence, separation of lanthanides,
3	Jan 19, 2024 Jan 20, 2024	Lanthanide compounds
4	Jan 26, 2024 Jan 27, 2024	Actinides: General characteristics of actinides, chemistry of separation of Np, Pu and Am from uranium,
5	Feb 02, 2024 Feb 03, 2024	Transuranic elements, comparison of properties of Lanthanides and actinides with transition elements
6	Feb 09, 2024 Feb 10, 2024	Transuranic elements, comparison of properties of Lanthanides and actinides with transition elements
7	Feb 16, 2024 Feb 17, 2024	common ion effect, solubility product
8	Feb 23, 2024 Feb 24, 2024	theory of precipitation, co-precipitation, post precipitation, purification of precipitates.
9	Mar 01, 2024 Mar 02, 2024	Theory of Qualitative and Quantitative Analysis Chemistry of analysis of various groups of basic radicals
10	Mar 08, 2024 Mar 09, 2024	Theory of Qualitative and Quantitative Analysis Chemistry of analysis of various groups of basic radicals
11	Mar 15, 2024 Mar 16, 2024	Theory of Qualitative and Quantitative Analysis Chemistry of analysis of various groups of acidic radicals
12	Mar 22, 2024 Mar 23, 2024	Theory of Qualitative and Quantitative Analysis Chemistry of analysis of various groups of acidic radicals
13	Apr 05, 2024 Apr 06, 2024	Theory of Qualitative and Quantitative Analysis Chemistry of analysis of various groups of acidic radicals
14	Apr 12, 2024 Apr 13, 2024	chemistry of identification of acid radicals in typical combination
15	Apr 19, 2024 Apr 20, 2024	chemistry of identification of acid radicals in typical combination
16	Apr 26, 2024 Apr 27, 2024	chemistry of interference of acid radicals including their removal in the analysis of basic radicals

