

Programme: M. Sc. (Inorganic Chemistry)

Course Code: ICO-503

Title of the Course: Chemistry of P-Block Elements

Number of Credits: 03

Effective from AY: 2019-20

Prerequisites for the course:	Students should have studied the courses in Inorganic Chemistry at F Y B Sc, S Y B Sc, T Y B Sc and ICO-401 course at M.Sc. Part-I Chemistry so as to have basic knowledge of P-Block Elements	No. of Lectures
Course Objective:	To provide basic and advanced knowledge about P-Block elements, their compounds and complexes.	
Course Outcome	This course will give sufficient information about the periodic table in general and P-Block elements and their compounds in particular.	
Content:	<p>1. General trends of different properties in groups and periods in periodic table</p> <p>2. Chemistry of Group 13 Elements and their Compound 2.1 Introduction, physical properties, chemical reactions with oxygen, nitrogen, sulphur, halogens, HCl, NaOH, NH₃, mono-di-tri-chlorides, alums, organo-compounds of B and Al, difference between boron and other Gr. 13 elements, diagonal relationship. 2.2 Preparation, bonding and structure of diborane, higher boranes, borane anions, carboranes and metallocarboranes.</p> <p>3. Chemistry of Group 14 Elements and their Compound 3.1 Introduction, physical properties, compound of Gr.14: Oxides, di & tetra halides, hydrides, sulphides, complexes of Gr. 14, organosilicon compounds (except silicones), cluster compounds of Ge, Sn and Pb. 3.2 Carbon dating, graphene, metallocarbohedrenes, freons.</p> <p>4. Chemistry of Group 15 Elements and their Compound 4.1 Introduction, allotropes, physical properties, Preparation, properties and structure of: Hydrides, halides, oxohalides; 4.2 Preparation, properties and structure of Phosphorous: Oxides, oxyacids, sulphides, oxosulphides; organophosphorous compounds. 4.3 Classification, preparation, properties and structures of phosphazenes.</p> <p>5. Chemistry of Group 16 Elements and their Compound 5.1 Introduction, allotropes, physical properties, Preparation, properties and structure of: Hydrides, halides, oxohalides, oxides (except sulphur), oxyacids (except sulphur), classification of oxides. 5.2 Polyatomic sulphur cations, anionic polysulphides, compounds with sulphur as a ligand.</p>	<p>2 hr</p> <p>9 hr</p> <p>5 hr</p> <p>5 hr</p> <p>6 hr</p>

	<p>6. Chemistry of Group 17 Elements and their Compound</p> <p>6.1 Introduction, physical properties; preparation, properties and structure of: Oxides, oxyacids, halides, oxohalides, hydrogenoxide fluorides and related compounds.</p> <p>6.2 Preparation, properties and structure of: Polyhalide anions, polyhalonium cations, halogen cations.</p> <p>7. Chemistry of Group 18 Elements and their Compound</p> <p>7.1 Introduction, physical properties; preparation, properties and structure of xenon compounds (fluorides and oxides); organoxenon compounds, coordination compounds.</p> <p>7.2 Preparation, properties and structure of compounds of other noble gases.</p>	<p>6 hr</p> <p>3 hr</p>
Pedagogy:	Mainly lectures/ tutorials/ assignments /seminars/ presentations/ self-study or a combination of some of these could be used to some extent. Sessions shall be fractionally interactive in nature.	
Text books: References/Readings:	<p>1. J. D. Lee, <i>Concise Inorganic Chemistry</i>, Blackwell Science Wiley, 2015, 5th Ed. (Reprint)</p> <p>2. P. W. Atkins, T. Overton, J. Rourke, M. Weller and F. Armstrong, <i>Shriver & Atkins Inorganic Chemistry</i>, Oxford publications, 2009, 5th Ed.</p> <p>3. N. N. Greenwood & A. Earnshaw, <i>Chemistry of the Elements</i>, Elsevier, 2014 (Reprint), 2nd Ed.</p> <p>4. J. E. Huheey, E. A. Keiter, R. L. Keiter and O. K. Medhi, <i>Inorganic Chemistry: Principles of structure and reactivity</i>, Dorling Kindersley (India) Pvt. Ltd., 2009 (Reprint), 4th Ed.</p>	