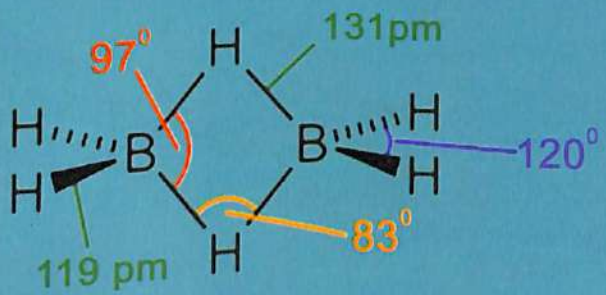
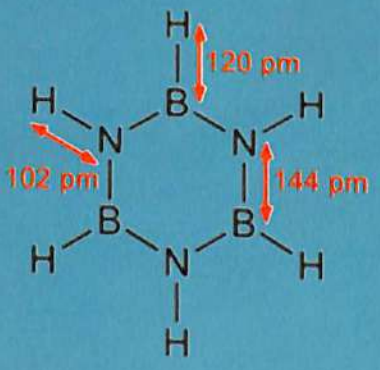
CONCISE B.SC. CHEMISTRY

WITH 14 - YEARS SOLVED QUESTIONS

VOLUME-II
(FOR 2ND SEMESTER, NON-MAJOR COURSE)

AS PER NEW B.SC. SYLLABUS,
DIBRUGARH UNIVERSITY, 2011-2012





DR. MRIDUL BURAGOHAIN

Concise B.Sc. Chemistry

With 14 - years Solved Questions

Volume-II
(For 2nd Semester, Non-Major Course)

As per New B.Sc. Syllabus, Dibrugarh University, 2011-2012

By

Dr. Mridul Buragohain, M.Sc, B.Ed, M.Phil, Ph.D

Assistant Professor, Department of Chemistry
Lakhimpur Girls' College, North Lakhimpur-787031

Concise B.Sc. Chemistry, Volume-II:
A Text Book Cum Success Guides for Chemistry student of B.Sc. 2nd Semester (Non-Major course), is written by Dr. Mridul Buragohain, Assistant Professor, Department of chemistry, Lakhimpur Girls' College, North Lakhimpur-787031; published by *GigaByte,North Lakhimpur* ; Price rupees 140 only.

First Edition : March, 2014

DTP : Author
Cover Design : Author

Published by : ***GigaByte, North Lakhimpur***

Printed at : **GigaByte Offset, Lakhimpur**

ISBN : 978-81-925209-1-9

Price : **₹ 140/-**

Preface

I am pleased to present the book **Concise B.Sc. Chemistry, Volume-II**, a text book cum success guides for Chemistry students of **B.Sc. 2nd Semester (Non-Major Course)**. The book has been written strictly according to the new syllabus prescribed by Dibrugarh University, 2011-2012.

The book has been written by complete solving last *14 years* questions set by Dibrugarh University strictly according to the new syllabus of B.Sc. 2nd Semester (Non-Major Course). Moreover all the important points in different topics included in the syllabus are written in the book. I hope that the book will be quite helpful to the students in acquiring the style and nature of questions that are asked in the previous year's examinations and the manner of answering them appropriately. Every effort has been made to present the answers lucidly by using a simple and clear language.

I sincerely hope that the book will be appreciated by our learned colleagues and students. I shall be glad to receive constructive suggestions for the further improvement of the book and will be gratefully acknowledged.

Lakhimpur
March, 2014

Dr. Mridul Buragohain

Contents **Page**

Semester wise Scheme of Examination and Course of Study
B.Sc. (Non-Major) Chemistry

Semesters	Paper No.	Title	Marks	
Semester-I	NM 101	General Chemistry I Inorganic Organic Physical	 (27+7 Int.)=34 (27+7 Int.)=34 (26+6 Int.)=32	100
Semester-II	NM 201 NM 202	Inorganic Chemistry-I Inorganic Lab	(48+12 Int.)=60 (32+8 Int.)=40	100
Semester-III	NM 301 NM 302	Organic Chemistry- I Organic Lab	(48+12 Int.)=60 (32+8 Int.)=40	100
Semester-IV	NM 401 NM 402	Physical Chemistry I Physical Lab	(48+12 Int.)=60 (32+8 Int.)=40	100
Semester-V	NM 501 NM 502	Physical Chemistry- II Inorganic Chemistry- II Inorganic Lab	(32+8 Int.)=40 (32+8 Int.)=40 (16+4 Int.)=20	100
Semester-VI	NM 601 NM 602	Organic Chemistry- II Organic Lab Physical Lab Inorganic Lab	(32+8 Int.)=40 (20+5Int.)=25 (20+5 Int.)=25 (8+2 Int.)=10	100
			Total	**600**

- Int. = Internal Assessment
- Duration of Examinations (Theory): 3 hours per paper
- Duration of Examination (Practical): 6 hours per paper

Chapter wise Marks Distributions
Semester-II (Non-Major)

Paper: NM-201 **Total Marks: 60**

Inorganic Chemistry

Objective: To understand Inorganic Chemistry in the form of materials science.

Unit	Chapter	Marks
Unit-I	Coordination Chemistry and Inorganic Material Chemistry	14
Unit-II	Chemistry of Non-Metals	14
Unit-III	Inorganic Material Chemistry	10
Unit-IV	General Principles of Metallurgy	10
	Theory Total	48
	Internal	12
	Total Marks	60

Semester-II (Non-Major) Syllabus

Unit-I: Coordination Chemistry and Inorganic Material Chemistry

Review of Werner's theory, Types of ligands, monodentate, bidentate ambidentate and polydentate ligands (including π -acceptor and macrocyelic ligands). IUPAC (post 2005) nomenclature of co-ordination compounds. Isomerism of 4-and 6- coordinate compounds. Introduction to valence bond and crystal field theory.

Application of dimethyl glyoxime, EDTA, 8-hydroxy quinoline, 2,2-bipyridyl, and ethylene diamine in analysis.

Marks: 14

Unit-II: Chemistry of Non-Metals

Boron	:	Preparation, structure and bonding of diborane
Silicon	:	Structure, properties and use of silicon carbide and silicon polymers (linear).
Nitrogen	:	Hydroxylamine, Hydrazine, Hydrazoic acid preparation properties, uses and electronic structure.
Rare gases	:	Xenon compounds
Phosphorous	:	Structures of oxides and oxyacids.

Marks: 14

Unit-III: Inorganic Material Chemistry

Zeolites, Ceramics, Glass, Silicates, and their uses.
Cement – composition, raw materials, manufacture, and setting of cement.
Inorganic metal oxides, Superconductor.
Synthesis, Structure and Application of Fullerenes.

Marks: 10

Unit-IV: General Principles of Metallurgy

Physico-Chemical methods involved in metallurgy (concentration, calcinations,reduction, roasting, zone refining, solvent extraction, hydrometallurgy and electrochemical methods) with reference to gold, nickel, thorium uranium and manganese (which ever is applicable).

Marks: 10

Chapter 1

Unit I: Coordination Chemistry and Inorganic Material Chemistry

1.1 Syllabus

Review of Werner's theory, Types of ligands, monodentate, bidentate ambidentate and polydentate ligands (including π - acceptor and macrocyelic ligands). IUPAC (post 2005) nomenclature of co-ordination compounds. Isomerism of 4-and 6-coordinate compounds. Introduction to valence bond and crystal field theory.

Application of dimethyl glyoxime, EDTA, 8-hydroxy quinoline, 2,2-bipyridyl, and ethylene diamine in analysis.

1.2 Important Points

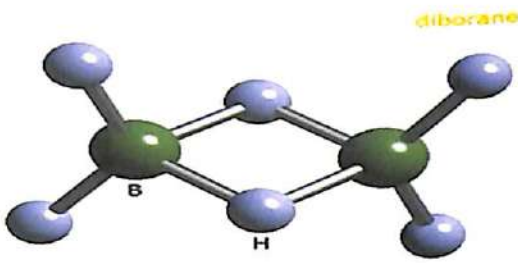
1.2.1 Werner's Coordination Theory

To characterize the coordination compounds Alfred Werner studied the physical, chemical and isomeric behaviour of the compounds by using simple experimental techniques. On the basis of these studies Werner, in 1898, proposed the *coordination theory*. The main postulates of Werner's theory of complex compound are:-

1. Metals possess two types of valencies:-
   (i) Primary or ionizable valency
   (ii) Secondary or non ionizable valency
2. Primary valencies of the central metal ion are satisfied by negative ions and in complex compounds it is equal to the oxidation state of the central metal atom / ion.
3. Secondary valencies of the central metal ion are satisfied by ligands (negative, positive or neutral) and in complex compounds it is equal to the coordination number of the central metal atom / ion.

CONCISE B.SC. CHEMISTRY

WITH 14 - YEARS SOLVED QUESTIONS



Dr. Mridul Buragohain, M.Sc, B.Ed, M.Phil, Ph.D, is Assistant Professor, Department of Chemistry, Lakhimpur Girls' College, North Lakhimpur, Assam -787031. He has successfully completed two Minor Research Projects (MRP) funded by UGC-NERO as Principal Investigator. He has published 16 research papers in standard National and International peer reviewed journals. He has been presenting research papers in National Seminars and National Science Congress. Also he is a Reviewer of Polish Journal of Environmental Studies, POLAND. In addition to the above, he has been Life Member of International Journal of Research in Chemistry and Environment, Gauhati University Research Scholars' Association, Assam Science Society and Honorary Member in the Editorial Board of International Journal of Research in Chemistry and Environment (IJRCE), EISSN 2248 –9649, etc.

Price: ₹140/-

ISBN : 978-81-925209-1-9