

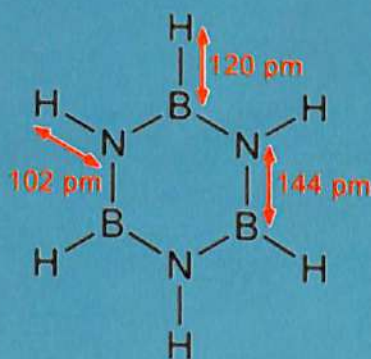
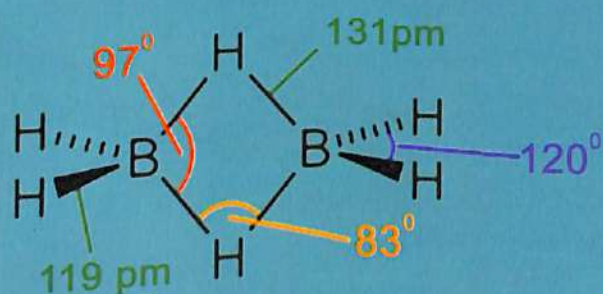
CONCISE B.SC. CHEMISTRY

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

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Concise B.Sc. Chemistry, Volume-II:

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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

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

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

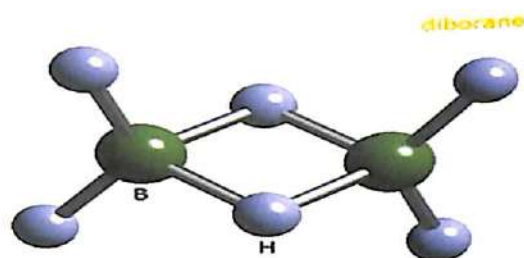
1.2.1 Werner's Coordination Theory

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



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