CHEMISTRY MODULES

(For AICTE Approved Colleges)

Prepared by

Department of Chemistry

Indian Institute of Technology

(Banaras Hindu University)

Varanasi – 221005

Preface

The genesis of this module lies in the Induction Program first conceived and started by IIT(BHU) on 2016 on mass scale for about 1000 students. The fact is that the students are overburdened and stressed out due to a hectic high school life. To refresh their creative mind, they were exposed to month long diverse credit courses like Physical Education, Human Values and Creative Practices, as well as several non-credit informal activities. In a welcome step the AICTE has proposed to extend this program to the Engineering Colleges affiliated to them.

In fact, purpose of this module is to bridge the gap between what the students need to know before they can start taking the advanced courses in the college level and what they are actually aware of from the intermediate level. Consequently, after the completion of the 3-weeks induction program, it is proposed that (besides other subjects) bridge courses in basic Physics, Chemistry and Mathematics should be taught to these students for the rest of the semester. The bridge courses will cover typical weaknesses of students in science at the 10+2 level.

The modules in Chemistry are prepared keeping in mind that an hour of discussion will bring all the students in the same stage such that they can cope up with the courses in their college level, that requires the concepts of different topics in Chemistry. The modules are made as interactive sessions between the students and the instructors. Furthermore, we have discussed those topics which harder to understand. At the end of the discussion teacher may also take a small test to understand how much the students followed the class.

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Department of Chemistry

IIT(BHU), Varanasi

Module 1 on Coordination Chemistry

1st Lecture: Importance of coordination chemistry, Types of complexes, Classification of Ligands.

2nd Lecture: Crystal Field Theory to explain nature of bonding in octahedral complexes.

3rd Lecture: Crystal Field Theory to explain nature of bonding in tetrahedral, tetragonally distorted octahedral and square planar complexes.

4th Lecture: Magnetic properties of all types of complexes.

5th Lecture: Color of complexes, Interpretation of Intensity of absorption bands in various complexes.

Module 2 on Organic Chemistry

Lecture 1

Introduction to Reaction Intermediates: Carbocations: Generation, stability, reactions and applications in synthetic organic chemistry, Exercise.

Lecture 2

Free Radicals: Generation, stability, examples and applications in synthetic organic chemistry, Exercise.

Lecture 3 & 4

Carbenes and Nitrenes: Generation, stability, examples and applications in synthetic organic chemistry, Exercise.

Module 3

Basics of Electrochemistry 2 lectures

Module 4

Chemical Kinetics 4 lectures