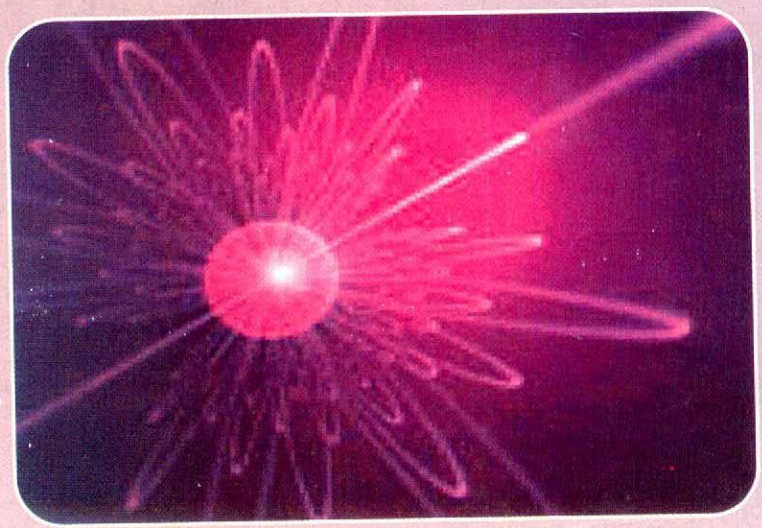
Huque and Nawab

Principles of Physical Chemistry



Fully Revised by

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Brothers' Publications

Huque and Nawab

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Mohammad Yousuf A. Mollah

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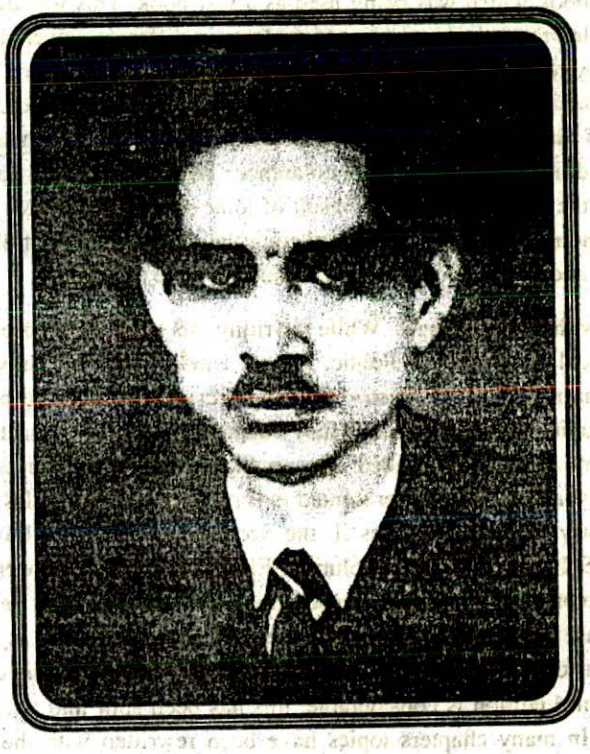

Late Professor M. Ali Nawab

Professor M. A. Nawab was the senior author of the First Edition of the book. He was Professor of the Department of Chemistry of Dhaka University. Late Professor Nawab was the Chairman of the Department of Chemistry of Dhaka University during 1973-1976. Professor Nawab expired on 23 April 1993.

PREFACE TO THE REVISED EDITION

The first edition of 'Principles of Physical Chemistry' was published in 1968 and the third edition came in 1974. The authors did not make attempts to bring out further editions of the book as at that time science text books written in Bengali were preferred by the students. We had forgotten about the book. Professor M. A. Nawab, the senior author expired in1993. Then about three years back a former student of mine who was doing undergraduate studies in Pharmacy in a Private University in Dhaka showed me a photocopy of the original third edition of the book which was being used as a text book. This was described as a 'fully revised edition'. A survey revealed that a large number of students in different universities and colleges in Bangladesh were using this 'fully revised edition' as a text book of Physical Chemistry. As mentioned this was not a Revised Edition as the authors did not make any revision after the third edition. Professor M. Yousuf A. Mollah. Professor of Physical Chemistry at the Dhaka University, persuaded me to prepare a revised edition. I agreed on condition that he will be a co-author. The book on Physical Chemistry being presented with the same title as the original one is the result of joint efforts of Prof. M. Yousuf A. Mollah and me. We traced the printing house which had been marketing the photocopies as 'fully revised edition'. They apologized for their action and agreed to publish the edition we have prepared.

This is a Fully Revised Edition with major changes. While rewriting this book we focused on the syllabii of undergraduate courses on Physical Chemistry of Public, Private Universities and University Colleges in Bangladesh. The students of Pharmacy, Biochemistry and Engineering will also be benefited from this book. All through the book SI units have been used. Many chapters have been rewritten with additional materials. A number of chapters have been divided into smaller chapters for the convenience of the students. For example, Thermodynamics has been presented in three chapters with titles: Thermodynamics I: the First Law, Thermochemistry, Thermodynamics II: the Second and the Third Law. The chapter on Solution has been divided into Solution and Dilute Solution. Electrochemistry has been divided into two chapters: Electrolytic Conduction and Electrolysis, Electrochemical cells. The chapter on Reaction Kinetics has been presented completely in a new format. Acids and Bases have been presented as a separate chapter. Solubility and Solubility Product form a new chapter. As the material presented in the chapter on Surface Chemistry and Colloids in the third edition is considerable, this has been split into two chapters: Surface Chemistry and Colloidal State. In many chapters topics have been rewritten with the inclusion of new materials and presented in a better way. Brief discussion of mass spectra, IR and N.M.R. spectra and their applications are included in the chapter on Physical Properties and Molecular Structure. End of Chapter Questions and Problems have been revised, many new questions and problems with answers have been incorporated. The format of the book has also been changed.

We hope that the Revised Edition of the book with its new look will receive the same acceptance by the students and teachers as the earlier editions.

Printing of this book has been an arduous task. The publishers are not well acquainted with printing a book on science with a lot of figures and formulae. They have, however, made great efforts to keep the book free of printing mistakes. We thank the publishers for their valiant efforts. In spite of their best intentions you will find some errors. We hope to eliminate these in the future edition.

January, 2009

M. M. Huque

PREFACE TO THE SECOND EDITION

We are gratified to see that the first edition of the book has been well accepted by the students and teachers in spite of the numerous printing errors. In the preparation of second edition attempt has been made to increase the clarity of the presentation at several places. The number of numerical examples at the end of the chapters has been considerably increased. Apart from these changes little has been altered in the arrangement of the material and the get up. We have also tried hard to keep the printing errors at the minimum.

We are indebted to many of our colleagues in the universities and colleges who have kindly sent their criticisms and pointed out the shortcomings of the first edition. These have been of great help in making improvement in the clarity of representation.

We are sorry, we could not make the book completely free of mistakes in spite of our best wishes.

January, 1971
Dhdka

M. M. Huque
M. A. Nawab

PREFACE TO THE FIRST EDITION

Printing of an object by a hundred painters, or writing of a hundred poetry on the same subject need no explanation, but writing on a book on a subject like Physical Chemistry calls for an explanation specially when excellent books in English are available. During the last many years of teaching Physical Chemistry to the undergraduate students, we have always felt the necessity of explaining the fundamental concepts. We believe that once the basic principles have been understood by the students, more than half the battle is won. In this respect, there is a need for a book on Physical Chemistry for our students whose background is different from those for whom the available books are meant. Many of these books cover fields wider and deeper than what is needed for our undergraduates at the B. Sc. (Pass) level. We, therefore, felt the necessity of writing a book on Physical Chemistry that would fully meet the requirements of the B. Sc. (Pass) students and at the same time help in building a sound background for the Honours students. We always tried, while writing the book, to explain the basic principles as clearly and elaborately as possible. It is upto the teachers who teach the subject and the students who would read to judge whether our aims have been fulfilled.

In the book most portions deal with the kinetic theory, thermodynamics and chemical kinetics. We have used some final results and equations of Quantum Chemistry and did not go anywhere beyond it because we thought that Quantum Chemistry and Statistical Mechanics should be treated at a higher level. Although the approach has been basically classical attempts have been made to acquaint the students with thermodynamic approach. In many places both kinetic and thermodynamic treatment have been used to show that identical results can be obtained. Only the methodology and physical concept are different. Quantum mechanical approach has been kept to minimum, only flashes appear here and there.

In several places we have gone a little beyond than what is expected to form the syllabus of Pakistani Universities. The idea is to point to the fact that improvements need be made as is constantly being done in western countries. This is further meant to provide the mental food for the more serious and above average students. The average students may leave out these portions on advanced treatment.

Contrary to common practice we have not included a chapter on atomic structure and radioactivity. These two topics generally form a part of Inorganic Chemistry syllabus in our country and excellent treatment is available in text books of Inorganic Chemistry. We therefore, thought it wise to leave out the branches from the present volume. This has considerably reduced the size of the book.

We express our thanks to a number of our colleagues who always inspired us during the writing of the book. Thanks are specially due to Prof. M. H. Khundkar, Head of the Department of Chemistry, University of Dhaka, for his encouragement at various stages. Mr. A. J. Mahmood, Senior Lecturer in Chemistry, University of Dhaka, deserves special thanks for kindly going through a large portion of the manuscript and making valuable suggestions. Thanks are also due to Mr. A. N. M. Akhter, a student of the Dhaka College, for drawing a number of original sketches and helping in making the design of the dust cover. We are indebted to Mr. Mesbahul Haque for preparing the index. We must also thank Mr. Syed Md. Fazlul Huq of the Students' Publications for taking the task of publishing the book. Mr. A. K. M. Raja Meah deserves special mention for his untiring efforts and hard work in the printing of the book.

Good printing is a challenging task and in spite of our best efforts some mistakes are still there. We apologise for this and hope to improve in the next edition. We shall appreciate receiving comments from those who use the book, so that improvements can be made in future.

Department of Chemistry
University of Dhaka
January, 1968

M. M. Huque
M. A. Nawab

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