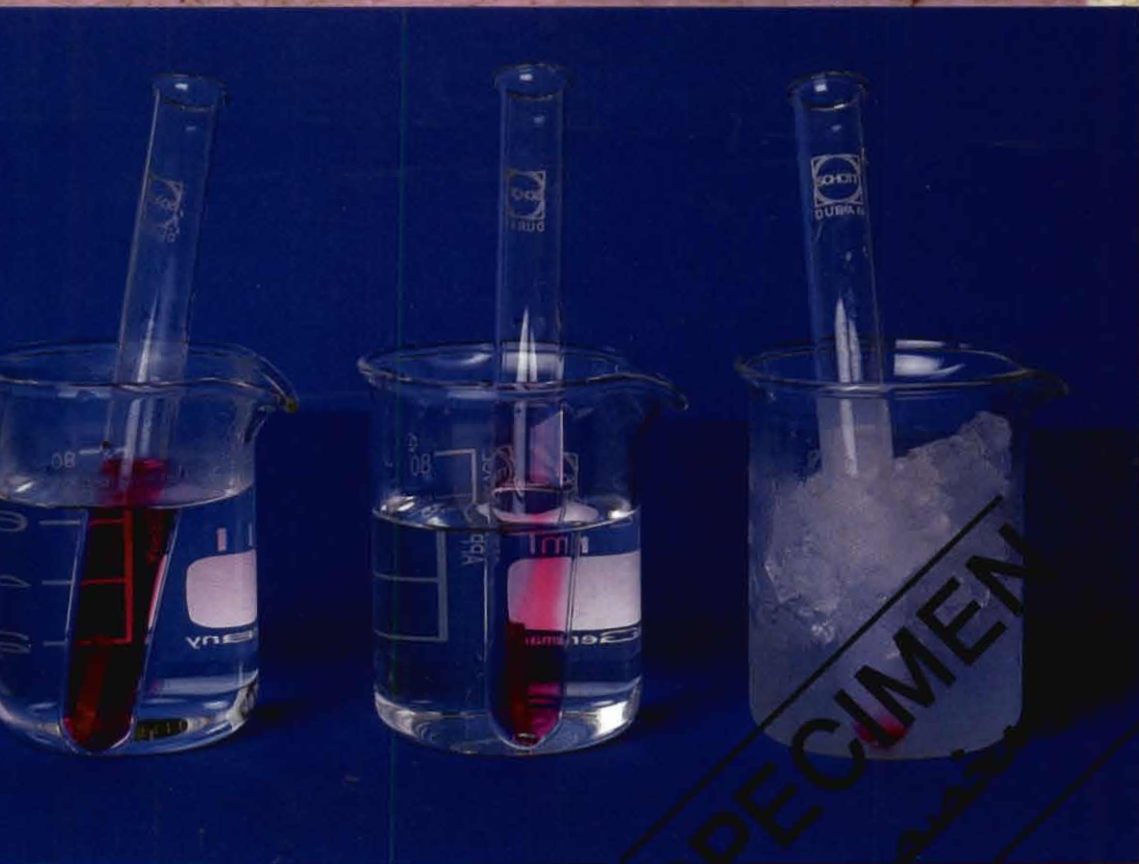


Chemistry

Secondary Education
Third Year
General Sciences
Life Sciences Sections



ORBITALS Collection

REVISED EDITION

Center for Educational Research and Development



National
Textbook

New Curriculum

Republic of Lebanon

Ministry of Education and Higher Education



CHEMISTRY



Secondary Education

Third Year

Sections: General Sciences - Life Sciences



Center for Educational Research and Development

National
Textbook

New Curricula

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CHEMISTRY



Secondary Education

Third Year

Sections: General Sciences - Life Sciences

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Together We Build Through Education

The Center for Educational Research and Development (CERD) has embarked on an extensive workshop for assessing and developing the educational framework and curricula which have been placed into effect more than three years ago. With full realization of the fact that the educational cycle must continue normally through its components, and until the development process attains its aspired objectives, we are placing in the hands of students, teachers and directors of public schools, this corrected version of textbooks issued by CERD as part of the National Textbook Series.

This version is an interim stage incorporating the corrected typographical and linguistic errors discovered by CERD specialists as well as teachers and students through their daily dealings with the books. The process of assessment and development of the framework and curricula will take into consideration all the comments that have been made, or will be made, in this regard.

It is expected that once the curricula are developed and aligned with the general and specific objectives set for them, the textbooks will be realigned with the new curricular and framework requirements, including tying the content of a course to the number of teaching hours set for it during the school year, taking into consideration vertical alignment within the same course as well as the horizontal alignment with the rest of the courses.

I take this opportunity to invite all school administrators, teachers and students and all officials concerned in public and private schools alike, to promptly send their comments on these curricula and books as their contribution to enrichment of this momentous national process.

This workshop, which was launched under the kind sponsorship of His Excellency the Minister of Education and Higher Education in implementation of Decree No. 10227 embodying the educational curricula and their objectives, fits in with CERD's proclaimed new motto "Together We Build Through Education".

It is our earnest desire to see this national, all-inclusive workshop attracting the greatest amount of interest and participation to define the safest and soundest educational options that directly affect our children, as we vow to continually modernize education and develop its ways and means to keep abreast of modern developments and progress in science and technology.

Dr. Leila MALEEHA
President CERD

Forward

This chemistry book for the third secondary year covers the programs of the General Sciences section and the Life Sciences section.

For the Life Sciences section, the program includes the following units: gaseous state, chemical kinetics, chemical equilibrium, acid-base reactions in aqueous solutions, pH metry, organic chemistry II, polymers, soaps and detergents, current medicinal drugs and new materials.

The General Sciences program consists of the same program as the life sciences, except the following parts: Amines and α -amino acids, soaps and detergents, current medicinal drugs and new materials.

In writing this book, the same approach has been adopted, as for the second secondary year scientific section, using a simple scientific language and illustrations rich in (figures, schemes, tables, ...). Our aim is to make the comprehension of scientific concepts easy for the students, in addition, to develop their experimental scientific attitude.

The program as a whole can be divided into two main parts, one based on classical conceptual chemistry and the other is based on applied chemistry. In the second part, the following themes are grouped: polymers, soaps and detergents, current medicinal drugs and new materials. These two parts together emphasize the applications of chemistry in everyday life and its importance in modern technologies.

Since at the end of the third year of the secondary cycle, the students will take official examinations, we paid attention to the development of the themes of the program to fit the actual time of study, and the exercises given at the end of each chapter are of the same spirit as the exercises of the exams.

The book is divided into sixteen chapters. Their organization is identical to those presented in the chemistry book for the second secondary year scientific section.

Each chapter is introduced by an illustration and a commentary related to the theme. The objectives to be achieved, the prerequisites and the chapter content are presented as an introductory page.

On the pages reserved for the course, illustrations are given as pedagogical support to the concepts to be studied.

The active learning method, which consists of conducting experimental activities, where the interpretation of the results allows understanding of the scientific concepts, is adopted each time the studied theme permits.

The solved exercises aim to serve as direct application to the preceded scientific notions.

The method sheets are supplements, often necessary, to complete the knowledge of the student on a given subject.

The laboratory investigations (LI), which are more detailed than the experimental activities, are complete experimental applications related to the theme of the chapter. However, these investigations have a supplementary role that will be specified later in this introduction.

The documentary activities fewer in number than those found in the program of the second secondary year scientific section, but they are particularly important for the applied chemistry part of the program.

The activities of the themes of this part constitute a true supplement to the text, because they allow the student to better understand and to extend his knowledge for these themes. The teacher should exploit these activities by asking more questions related to the content of the text.

The exercises given at the end of each chapter are mainly either of the classical type, or of experimental character or taken from everyday life.

At the end of each of the nine units of this book, another group of exercises are given under the heading: Evaluation. They correspond generally according to the length of the unit or to a number of the following three domains of competencies (or to all of them):

Applying of knowledge

Designing an experiment

Communicating.

Because these exercises are few in number, they only serve as simple examples to the kind of exercises that could be proposed in the evaluation method based on the domains of competencies.

The laboratory investigations (or their equivalents) are sometimes proposed as exercises in the domain entitled: Designing experiment.

Finally, the comments and suggestions communicated to us by our colleagues about the chemistry textbook of the second secondary year scientific section were of great help. All comments and suggestions about this book are welcome.

The authors

Features of the Book

Unit Opener

- Photos introducing the chapter.

- Commentary introducing the subject of the chapter.

Title

Objectives

Prerequisite

Chapter content

Course

- Introduction to the chapter.
- Light on scientists and on their role.
- Remarks and supplementary information.
- Presents definitions, results and conclusions.

Documentary Activities

- To widen the student's knowledge concerning all fields of applications.

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