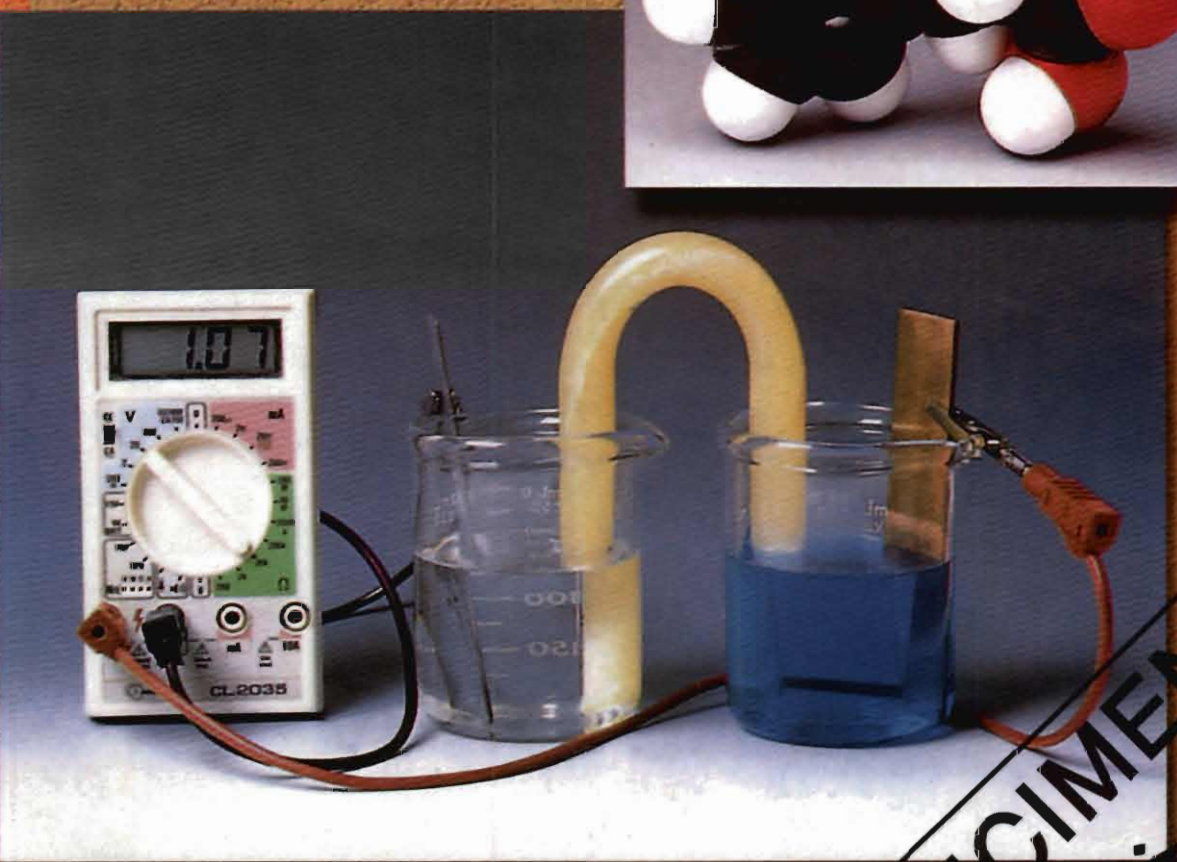
Chemistry

PART 2

Secondary Education
Second year
Sciences Section



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Center for Educational Research and Development
National Textbook
New Curricula

Republic of Lebanon

Ministry of Education and Higher Education

CHEMISTRY

Secondary Education

Second Year

Sciences Section

Center for Educational Research and Development

National Textbook

New Curricula

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CHEMISTRY

Secondary Education
Second Year
Sciences Section

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The National Textbook Project

This is the second installment of textbooks completed by the Center as part of a three-stage effort to produce the books called for by the New Curricula. We are placing these books in the hands of students with the great hope that we are moving, step by step, toward the goal of acquiring sound and modern learning, using sophisticated educational means and up-to-date methodology that encourage and reinforce individual thinking and research, the acquisition of skills, the development of ethical and national attitudes, the feeling of national belonging as well as the feeling of belonging to humanity at large.

The on-going revolution in information, communication and educational technology has undoubtedly limited the role of the textbook and lowered the rank it used so recently to occupy. However, in our society and in many other societies, the textbook remains the basic means of education, and it is our duty to exert our utmost effort and care to come up with the best product as to form and content. Yet we should not lose sight of the fact that the textbook is not sufficient by itself but should rather be used as a stepping stone to access other sources of information. What is important is to keep a clear vision and maintain the right course toward our objective. The means should not turn into the end and the student should always remain the focus of the learning/teaching process.

No one ignores or denies the fact that textbook writing requires very high academic and educational qualifications and very wide field experience. The authors committees undeniably possess such qualifications and qualities, yet last year's textbooks did contain some faults and gaps which were duly pointed out by researchers in many articles, and, indeed, we have benefited from some of them. Such is the nature of human work, no matter how good the intentions or how great the effort exerted.

Constructive criticism is a real contribution to raising the standard of authorship, minimizing errors and filling gaps. We only hope that criticism will always be objective and motivated by a desire to enhance educational reform in order to achieve better products.

A favorite adage handed down from our old scholars: "He who criticizes you is as helpful as a co-author". Let all criticism directed at the Center be of this caliber.

In closing, we hope that we all will have benefited from our experience and that the textbooks of the third and final stage be closer to realizing our hopes and more beneficial to our students. We are now preparing ourselves to assess the parts so far achieved of the new curricula and to assure that our educational movement is proceeding on the right track for achieving the best results.

June 2, 1999

President, National Center for Educational Research and Development

Nemer FRAYHA

Note to teachers and students:

This is part two of the text book which constitutes ten chapters.

General Coordinator

Foreword

The chemistry curriculum of the second year of the secondary education – scientific series is fundamentally composed of two main parts. The first deals with conceptual chemistry: thermochemistry, electrochemistry, atomic orbitals and organic chemistry. The second deals with industrial chemistry and pollution: industrial inorganic chemistry, petroleum and natural gas, metallurgy, and pollution, with a major goal: to show that chemistry is a concrete science, and to emphasize its importance in the economy of a country as well as its applications in everyday life.

The curriculum takes into account that the student is acquainted with basic chemistry, in the first secondary year and in previous years, and that, according to the scientific series, he can be motivated to a diversified content.

However, in order to attain the planned pedagogical objectives which are:
To help the student to understand scientific concepts and the acquisition of experimental work, as well as a scientific culture and considering the industrial part of the curriculum; our concern was to adopt a simple language, to ensure sufficient illustration (photos, schemes ....) and to follow the organization of the book.

Organization of the book

The book is divided into sixteen chapters all having similar pattern.

Each chapter is introduced by an illustration and a commentary related to the topic to be discussed. In this introduction page the objectives, the prerequisites, and the chapter contents are given.

The illustration given in each chapter is conceived as an essential pedagogic support especially in the chapters of industrial chemistry and pollution where laboratory investigations generally are not considered. In the chapters concerning the conceptual parts of the curriculum, these investigations, illustrated in the text, play the role of pedagogical support.
They are an experimental and concrete introduction to the studied concepts. The interpretation of their results leads to the understanding of the concepts.

The solved exercise is a direct application of scientific notions, which precedes it. The chapter review is its summary. It includes the principle notions discussed. The method sheets are a supplement, sometimes necessary to complete the treated topics. The laboratory work sheets, which are more elaborated than the laboratory investigations, are complete experimental applications related to the subject of the chapter.

The documentary activities are numerous and diversified, written in a simple style constitute a supplementary information to the student. This diversity and the easy style will provoke his interest.

The different forms of exercises (fill in the blanks, multiple choice, classical exercises and exercises taken from daily life), help the student to understand and assimilate the scientific subjects studied.

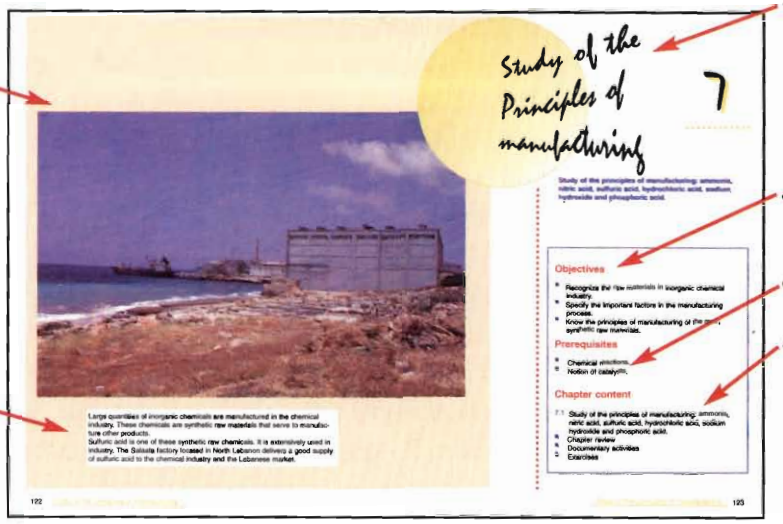
Finally, all suggestions that our colleagues will kindly communicate to us will be received with our great attention and interest.

The authors

Features of the book

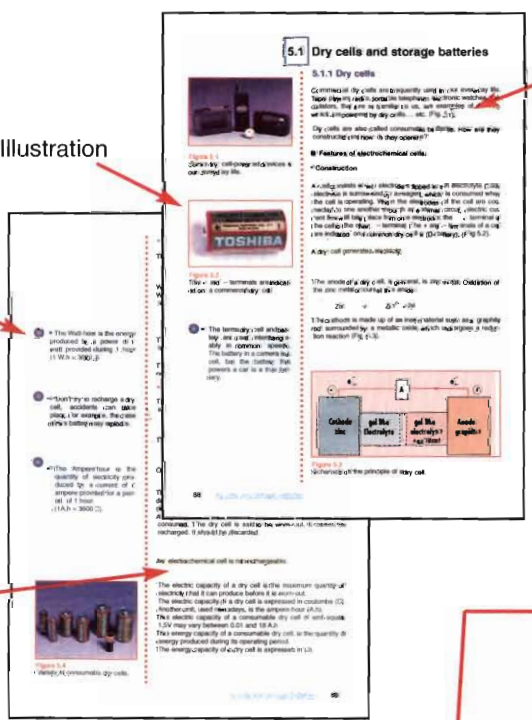
Unit Opener

- Picture introducing the chapter
- Commentary introducing the chapter
- Title
- Objectives
- Prerequisites
- chapter Contents



Course

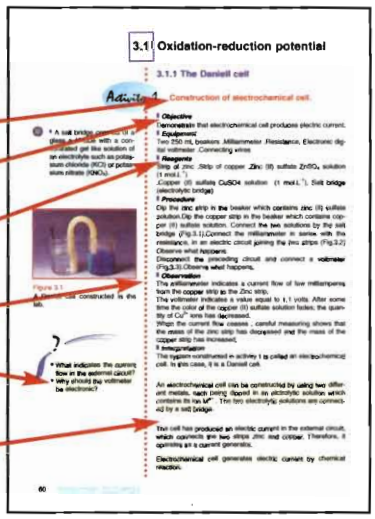
- Introduction to the chapter
- Illustration
- Remarks and supplementary information
- Presents definitions, results and conclusions



Documentary activities

- To widen the students knowledge concerning all fields of applications

Experimental activity


3.1 Oxidation-reduction potential

3.1.1 The Daniell cell

Activity 1 Construction of electrochemical cell.

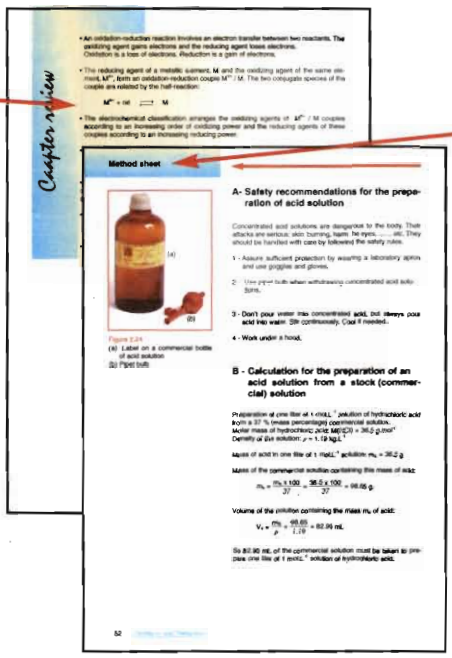
- Title
- Objective
- Procedure
- Observation
- Questions to be answerd
- Interpretation

Laboratory investigation


LABORATORY INVESTIGATION

Identification test of some metallic cations in solution

- Elaborated experimental work applied to subject presented


Chapter review

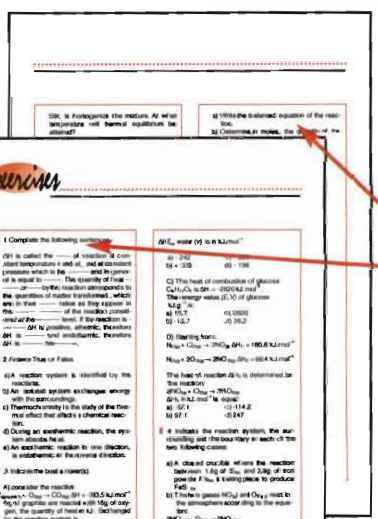
Method sheet

A- Safety recommendations for the preparation of acid solution

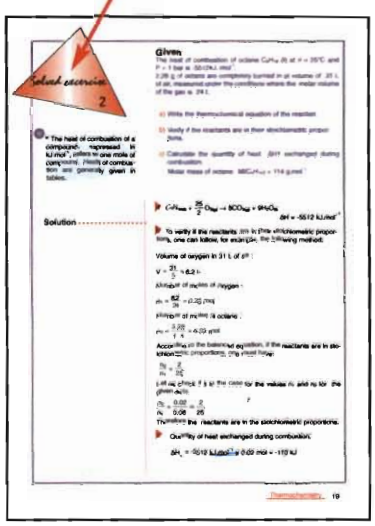
B - Calculation for the preparation of an acid solution from a stock (commercial) solution

- Chapter review
- Method sheet

Exercises


Exercises

- MCQ
- classical questions and applications to everyday life


Solved exercise 2

Given

Solution

- Solved exercise direct application to the proceded notion

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