THE YOUNG CHEMIST. A BOOK OF LABORATORY WORK FOR BEGINNERS

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649527885

The Young Chemist. A Book of Laboratory Work for Beginners by John Howard Appleton

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

www.triestepublishing.com

JOHN HOWARD APPLETON

THE YOUNG CHEMIST. A BOOK OF LABORATORY WORK FOR BEGINNERS

Trieste

THE

YOUNG CHEMIST:

A BOOK

OF

LABORATORY WORK,

FOR BEGINNERS.

BY

JOHN HOWARD APPLETON, A. M.,

PROFESSOR OF CHEMISTRY IN BROWN UNIVERSITY.

FIFTH EDITION.

SILVER, BURDETT & COMPANY

NEW YORK . . . BOSTON . . . CHICAGO

1897

PROFESSOR APPLETON'S

SERIES OF CHEMICAL TEXT-BOOKS:

I. The Beginner's Handbook of Chemistry: *Price*, $1.00. This is an introduction to the study of Chemistry, suitable for general readers. It treats chiefly the non-metals, these being generally found to furnish the best material for an elementary course, and to best illustrate the fundamental facts and principles of the science.

The book is written in an attractive style, and has had a very large sale. It is profusely illustrated with engravings, and has, in addition, fourteen colored plates.

II. The Young Chemist: *Introductory Price, 75 Cents.* A book of chemical experiments for beginners in Chemistry. This is designed for use in Schools and Colleges. It is composed almost entirely of experiments, those being chosen that may be performed with very simple apparatus. The book is arranged in a clear, systematic, and instructive manner.

III. Report-book of Chemical Experiments. *First Series. Introductory Price, 25 Cents.* A well arranged memorandum-book, with blank spaces to be filled by the pupil during the progress of his experiments.

The making of a succinct report by the student, is of great service in leading him to form the habit of taking written notes while the facts of the experiment are fresh in the mind. Morover, it undoubtedly increases the powers of observation.

This Report-book is so constructed that it may be used with "The Young Chemist," or with any text-book on general chemistry.

IV. Qualitative Analysis: *Introductory Price, 75 Cents.* A brief but thorough manual for laboratory use.

It gives full explanations and many chemical equations. The processes of analysis are clearly stated, and the whole subject is handled in a manner that has been highly commended by a multitude of successful teachers of this branch.

V. Quantitative Analysis: *Introductory Price*, $1.25. A text-book for school and college laboratories.

This volume possesses novel and striking merits such as will make it worthy of the same decided approbation and large sale that have been awarded to the earlier books of this series. The treatment of the subject is such that the pupil gains an acquaintance with the best methods of determining all the principal elements, as well as with the most important type-processes both of gravimetric and volumetric analysis.

THE EXPLANATIONS ARE DIRECT AND CLEAR, so that the pupil is enabled to work intelligently *even without the constant guidance of the teacher.* By this means the book is adapted for self-instruction of teachers and others who require this kind of help to enable them to advance beyond their present attainments.

VI. Chemical Philosophy: *Introductory Price*, $1.40. A text-book for schools and colleges.

It deals with certain general principles of chemical science, such as the constitution of matter; atoms, molecules, and masses; the three states of matter and radiant matter, the change of state from one form of matter to another. It also presents such topics as Boyle's and Mariotte's law, Charles' law, and the other general laws of matter. It discusses from a chemical standpoint certain forms of energy, such as heat, light, electricity. It treats of the nature of chemical affinity; the chemical work of micro-organisms; the modes of chemical action; thermo-chemistry; and those attractions of substances which are partly physical and partly chemical. It also presents a full study of atomic weights: the methods leading to a first adoption of them, and then to the grounds sustaining certain numbers selected. The periodic system is of course discussed.

The work is fully illustrated.

Copies sent by mail, postpaid, *upon receipt of Introductory price*, by

SILVER, BURDETT & CO., 110-112 Boylston St., Boston.

PREFACE
TO THE REVISED EDITION.

THE purpose of this little book is to aid in the instruction of pupils in chemistry. The method employed is the experimental or object method.

Every experienced teacher has remarked the wonderful ease and pleasure with which beginners in chemistry—*when they are allowed to perform experiments*—grasp the facts and principles of the science. It has also been recognized that the only objections to the experimental method arise from the greater expenditure of the teacher's time, and from the cost of supplies.

It is hoped that this little book removes one of these objections; and, fortunately, chemical apparatus and supplies can now be had at very low prices.

The following are some of the characteristic advantages of the book—

First.—The apparatus described, and the supplies called for, are of *the very simplest character.*

Second.—The experiments are described in clear and simple language, and in direct form; the pupil can hardly fail to perform them successfully, even without special aid from the teacher.

Third.—Dangerous experiments have been excluded. (But, of course, care must always be exercised in experimenting.)

Fourth.—The chemical elements are discussed in a scientific order which, while it aids the memory, does so upon correct principles.

Fifth.—Formulas and reactions are introduced freely, so that the student learns the new nomenclature and new notation without suspecting it. (But a systematic discussion of these subjects has been offered for purposes of reference, or for such other use as the teacher may judge best to make of it.)

It may also be added that this book is not an experiment. For many years it has been used with great success by many professors and teachers of wise judgment and large experience.

The present edition has been carefully revised throughout, and it is hoped that in its improved form it may be found to possess additional usefulness.

BROWN UNIVERSITY, 1892.

CONTENTS.

HINTS TO TEACHERS.

I. PERFORM slowly several experiments before the class. Let the pupils perform the same experiments (and no others), each at his own desk. After this let the pupils learn carefully the entire description of the experiments so performed.

It is highly desirable to have the pupils learn the *outline* of a given chapter, and recite it day after day, until the work of that chapter is finished. They thus discover the logical relation which binds the separate experiments into one whole; they also discover the scientific plan of the work.

II. Use extreme caution in experimenting. Be careful not to vary the conditions of an experiment, as stated in the book. Be exceedingly careful when you attempt experiments other than those described in this book.

Do not allow pupils to approach too near to an experiment in progress.

III. Use very small quantities of the substances prescribed.

IV. In preparing a gas, the most convenient apparatus is a side-neck flask or a side-neck test-tube.

The cuts need no explanation.

FIG. 1.—Evolving a gas by use of a side-neck flask.

FIG. 2.—Evolving a gas by use of a side-neck test-tube.