LABORATORY DIRECTIONS FOR ELEMENTARY CHEMISTRY

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LABORATORY DIRECTIONS
FOR
ELEMENTARY CHEMISTRY

DESIGNED TO ACCOMPANY
A TEXTBOOK OF CHEMISTRY
BY W. A. NOYES

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PREFACE

The importance of the laboratory work in a course in elementary chemistry cannot be too strongly emphasized. It is only by the actual contact and experimentation with some of the many materials described in a text-book that the student ever comes to any realizing sense of the means by which the science of chemistry has been built up. For this reason it is advisable to supplement the laboratory exercises with discussions of an explanatory nature, in which the correlation between laboratory and text-book work may be brought out.

The experiments described in this guide have been chosen with the following objects in mind: To reduce the variety of materials handled, consequently the confusion of many new names and strange materials, to a minimum; to make each experiment a fairly exhaustive study of some particular material or property; to have the sequence of experiments such as will lead to a certain amount of reasoning from analogy. This guide does not pretend to be an exhaustive description of elementary experiments, but rather a selection of a few suitable, consecutive experiments from the many possible.

I wish to take this opportunity to acknowledge the many helpful suggestions and criticisms which I have received from Drs. C. W. Balke, C. H. Hecker, S. B. Hopkins and W. A. Noyes in the preparation of this book.

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GENERAL DIRECTIONS

Work in the laboratory should be undertaken with the following objects in mind: 1. By direct handling of the materials to become familiar with certain chemical reactions. 2. By analogy, and text-book study, to relate the experiments actually performed in the laboratory with as many facts brought up in the lecture and quiz room discussion as possible. 3. By handling and manipulating apparatus to become familiar with the tools at the disposal of the chemist, and the proper use of the same, and at the same time to acquire ability and dexterity in their use. A student, however good his understanding of chemical facts, has not reached the goal unless he is able to perform neatly and properly any given chemical manipulation. 4. To acquire habits of observation and a proper discrimination between important and unimportant details, and to draw conclusions of a general nature from a specific case. 5. To record accurately, briefly, and promptly the phenomena observed.

In the pursuit of these objects the keeping of a laboratory note-book is of prime importance. It is absolutely essential that these notes be recorded at the time the work is performed. They should give a clear but brief account of work done and should include a statement of the object of the experiment, a record of all phenomena observed, such as change of color, appearance of a precipitate or a gas, etc., and answer all ques-