

**EXPERIMENTAL  
CHEMISTRY FOR  
JUNIOR STUDENTS,  
PART I.-INTRODUCTION**

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Experimental Chemistry for Junior Students, Part I.-Introduction by J. Emerson Reynolds

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EXPERIMENTAL CHEMISTRY.

*PART I.*

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# EXPERIMENTAL CHEMISTRY

FOR  
JUNIOR STUDENTS.

BY  
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*PART I.—INTRODUCTION.*

FOURTH EDITION.

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1887.

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# PREFACE

TO

## THE FOURTH EDITION.

WHEN the first edition of this book was published it was intended to represent in some measure a reaction against the irregular 'test tubing' which prevailed in many chemical schools. The author is glad to know that the book has proved useful in the hands of many able teachers, and that his attempt to provide an elementary course of Chemistry which should afford training alike in method and theory has met with even greater success than he hoped.

It has been remarked that the writer employs the simple atomic symbols, in almost all cases, to indicate the elements which enter into chemical reactions, while demonstrating, by means of such experiments as number 29 and others, the two-atom structure of the molecules of a few of the elementary *gases*. The fact cannot be too strongly impressed on the student's mind that our present knowledge does not justify us in extending the use of the so-called 'molecular formulæ' for elements in the *gaseous* state (correctly



employed under experiment 29) to cases in which the elements concerned enter into the reactions in the state of *liquid* or of *solid*. Reactions of the latter class form the great majority of those commonly met with, and are best explained by equations which are free from unnecessary assumptions, but which adequately represent the relative atomic weights of the agents concerned in the chemical changes.

J. E. R.

*March 1887.*

# PREFACE

TO

## THE FIRST EDITION.

THIS work is identical in plan with my *Six Lectures on Experimental Chemistry*, but different in style, and much extended in range, so as to include the amount of knowledge of fact and principle usually expected from junior Arts, Medical and Pharmaceutical Students, as well as from the higher classes in Intermediate Schools.

The system pursued in this book is designed to lead the student through a series of connected experiments—often *quantitative* in form—and to assist him in the interpretation of his results, and in devising modes of testing the validity of the conclusions drawn from them. Thus while acquiring a tolerably wide knowledge of fact, the student receives a certain amount of training in the purely 'experimental method' of investigating Nature. If this training be sound, the study of Chemistry must prove a valuable means of mental education. How far the particular plan pursued in the following pages is likely to contribute to such a result, I must leave others to judge :

but a reviewer of my *Lectures* was so good as to say :—'In these Lectures the author departs widely from the usual routine of elementary treatises. . . . We believe that he is right in the plan he has adopted, and that instruction of this nature would greatly facilitate the acquisition of clear and distinct ideas of the leading facts and laws of Chemistry.' (*Chemical News*, vol. xxix. page 227.) This work is divided into four parts, each one being, as far as practicable, complete in itself. Part I. is introductory, and deals with first principles, and with the chemistry of the typical elements, hydrogen and oxygen, and their compounds; Part II., with the rest of the non-metals; Part III., with the metals; and Part IV., with organic chemistry. The experiments described are, whenever possible, those easily performed; in some cases, however, methods are necessarily detailed which the student may not have either the skill or the means to carry out, but he should endeavour to see these operations carefully conducted. It is assumed throughout that the reader can obtain some practical instruction in glass working and the construction of apparatus.

It is only necessary to add that the complete work will contain the solutions of all the problems in my *Lecture Note Book*.

J. E. R.

CHEMICAL LABORATORY,  
TRINITY COLLEGE, DUBLIN :  
*November, 1880.*