

**PRACTICAL CHEMISTRY,  
WITH NOTES AND  
QUESTIONS ON  
THEORETICAL CHEMISTRY**

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Practical Chemistry, with Notes and Questions on Theoretical Chemistry by William Ripper

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**WILLIAM RIPPER**

**PRACTICAL CHEMISTRY,  
WITH NOTES AND  
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**Practical Chemistry,**  
WITH NOTES AND QUESTIONS  
ON  
**THEORETICAL CHEMISTRY.**

ADAPTED TO THE REVISED SYLLABUS  
OF THE SCIENCE AND ART DEPARTMENT  
FOR THE ELEMENTARY STAGE OF INORGANIC CHEMISTRY.

BY  
**WILLIAM RIPPER,**  
*(Member of the Cleveland Institution of Engineers),*  
SCIENCE MASTER IN  
THE SHEFFIELD SCHOOL BOARD'S CENTRAL HIGHER SCHOOL.

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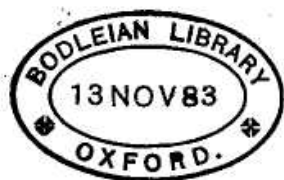
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## P R E F A C E .

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The following pages, intended in the first place for the students in the Sheffield School Board's Central Higher School, are submitted to teachers and students of chemistry, with the hope that they may be of service in other similar classes in preparing for the Science and Art Department's Examinations.

The work is divided into two parts :—

- I. A course of Elementary Practical Chemistry.
- II. Notes and Questions on the Theoretical course of elementary Inorganic Chemistry, intended to supplement the student's manuscript notes of Lectures and to be used with or without a text book.

The experiments herein described have been carefully selected, and are such as may be conveniently performed by young students in a laboratory. Many practical hints are given on the use of the apparatus, and for the careful performance of the experiments.

The reactions of the metals required by the Department's syllabus are arranged in a tabular form, so that the various tests can be much more readily compared and remembered than by the ordinary arrangement of reactions.

A large number of the Questions have been selected from Science and Art Department and other public Examination papers; and the problems have been arranged to ensure a knowledge of principles rather than as long Arithmetical Exercises.

The necessity for a large amount of practice in working chemical problems, especially in the earlier stages of the study, is admitted by all teachers of chemistry, and it is hoped that the solutions of typical examples, and the various hints given, will enable the student, after a little thought, to answer any of the Questions without difficulty.

The *Notes and Questions* have been in the hands of my pupils for some time, and to their use is largely attributed the success which has attended the Day Classes (composed of boys from 12 to 14 years of age) held at the Sheffield Central School. At the past two examinations held by the Science and Art Department in May, 1881 and 1882, 218 papers have been worked in the Elementary Stage of Theoretical and Practical Chemistry inclusive. Not one student failed in either subject, and 60 per cent. obtained first class certificates and prizes.

The Department's "List of Experiments for the guidance of teachers" and some blank leaves for notes are inserted at the end of the book.

I am indebted to Mr. GEORGE HINSE, Assistant Science Teacher in this school, for having kindly read and corrected my manuscript and the proof sheets.

*Central Schools, Sheffield.*

W. R.



# CONTENTS.

## PART I.

### PRACTICAL CHEMISTRY.

Introductory Hints and Experiments . . . . .	1
Preparation and Properties of Gases . . . . .	6
Combustion . . . . .	28
The Blowpipe and its Uses . . . . .	33
Table of Reactions of the Metals . . . . .	38
Reactions of the Acids . . . . .	46
Directions and Tables for Analysis . . . . .	50
Papers of Practical Questions . . . . .	55
How to write down Results . . . . .	60

## PART II.

### THEORETICAL CHEMISTRY.

Notes, Definitions, &c. . . . .	63
Arithmetical Chemistry, with Solutions of Problems . . . . .	69
Complete Summary of Equations . . . . .	76
Four hundred Questions on the Theoretical Course of Inorganic Chemistry, with Notes and Hints . . . . .	84
Appendix . . . . .	117
Answers to Arithmetical Problems . . . . .	118
The Department's List of experiments for the guidance of teachers . . . . .	128
Index . . . . .	137
Blank leaves for Notes . . . . .	138



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**PART I.**

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**PRACTICAL CHEMISTRY.**

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