

**A CLASS-BOOK OF  
INORGANIC  
CHEMISTRY WITH TABLES  
OF CHEMICAL ANALYSIS**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649035595

A Class-Book of Inorganic Chemistry with Tables of Chemical Analysis by D. Morris

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.  
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

[www.triestepublishing.com](http://www.triestepublishing.com)

**D. MORRIS**

**A CLASS-BOOK OF  
INORGANIC  
CHEMISTRY WITH TABLES  
OF CHEMICAL ANALYSIS**



A CLASS-BOOK  
OF  
INORGANIC CHEMISTRY:  
WITH TABLES OF  
CHEMICAL ANALYSIS,  
AND DIRECTIONS FOR THEIR USE:  
COMPILED SPECIALLY FOR  
PUPILS PREPARING FOR THE OXFORD AND CAMBRIDGE MIDDLE-CLASS  
EXAMINATIONS, AND THE MATRICULATION EXAMINATION OF  
THE UNIVERSITY OF LONDON.

BY  
D. MORRIS, B.A.  
LATE TEACHER OF CHEMISTRY IN LIVERPOOL COLLEGE.

NEW AND ENLARGED EDITION



LONDON:  
GEORGE PHILIP & SON, 32, FLEET STREET.  
LIVERPOOL: CAXTON BUILDINGS, SOUTH JOHN STREET;  
AND 49 & 51, SOUTH CASTLE STREET.  
1880.

193. f. 78

Handwritten text, likely bleed-through from the reverse side of the page. The text is mostly illegible due to fading and bleed-through, but some words like "The" and "of" are visible. There are also some small, dark marks scattered across the page.

## PREFACE TO NEW EDITION.

---

In the present Edition the whole of the work has been carefully revised, and a considerable amount of new matter has been added. The additions include chapters on the Compounds of Carbon and Nitrogen, Light and Spectrum Analysis, the Diffusion of Gases, &c., while the number of Examination Questions on the various parts of the work has been largely increased. The chapter on the Solution of Chemical Problems involving arithmetical operations has been re-written and extended, and a number of selected typical problems are appended to it for solution by the student.

In that portion of the work treating of Practical Chemistry several important changes have been made. The list of apparatus required for simple Qualitative Analysis is new, and will, it is believed, be found to be a tolerably complete list of all that is required for that most essential part of modern chemistry—laboratory practice. Table L, for the preliminary examination of substances in the dry way, has been re-arranged with a view to greater simplicity and accuracy, while Table V., for the detection of the more important acids, is quite new.

The changes made in the present edition are calculated to render the work more useful for the purpose for which it was originally compiled, *viz.*, to furnish students preparing for the University Examinations with a simple yet complete text book.

LIVERPOOL.

September, 1880.

## PREFACE TO FIRST EDITION.

---

THE following pages are simply enlarged notes of the most important facts of Inorganic Chemistry, which were originally culled from the best modern books on this subject for the use of the pupils under my charge. I have long felt the need of an Elementary Text-Book which should satisfy the requirements of the "Middle-Class Examinations;" and, to meet this want, I have compiled, in addition to the main facts of the science, Tables of Analysis of simple compound substances, with directions for their use, and Rules for sundry Arithmetical Exercises.

I strongly recommend to beginners in Qualitative Analysis the use of Table on page 180, on account of the simplicity of the method, as well as for the reason there stated.

The numerous Questions found in the work have been selected from the examination papers of Oxford, Cambridge, and London Universities, and the Science and Art Departments. The questions of the latter are denoted by \* : those of the Universities, by the initial letter of each respectively.

My thanks are due to Dr. Carter, of the Liverpool School of Science, for many valuable hints and suggestions.

D. M.

LIVERPOOL,  
Aug., 1870.



## CONTENTS.

---

	PAGE
Introduction . . . . .	1
Oxygen . . . . .	7
Measurement of temperature of bodies . . . . .	12
Expansion of gases . . . . .	13
Questions on Oxygen . . . . .	15
Hydrogen . . . . .	16
Compounds of Oxygen and Hydrogen . . . . .	19
Combining powers of the elements . . . . .	22
Measurement and weight of gaseous volumes . . . . .	23
Questions on Hydrogen . . . . .	26
Nitrogen . . . . .	25
The Atmosphere . . . . .	27
Diffusion of gases . . . . .	29
Compounds of Nitrogen and Hydrogen . . . . .	30
Compounds of Nitrogen and Oxygen . . . . .	32
Questions on the Atmosphere . . . . .	37
Questions on Nitrogen . . . . .	37
Carbon . . . . .	38
Compounds of Carbon and Oxygen . . . . .	40
Questions on Carbon and Oxygen . . . . .	45
Compounds of Carbon and Hydrogen . . . . .	45
Nature and structure of Flame . . . . .	47
Davy Lamp . . . . .	49
The Blow-pipe . . . . .	50
Compounds of Carbon and Nitrogen . . . . .	51
Questions on Carbon and Hydrogen . . . . .	53
Questions on Flame and the Blow-pipe . . . . .	53
Chlorine . . . . .	54
Compounds of Chlorine and Oxygen . . . . .	56
"          "          Nitrogen . . . . .	59
Questions on Chlorine . . . . .	60

	pages
Bromine . . . . .	61
Iodine . . . . .	63
Fluorine . . . . .	65
Questions on Iodine, Bromine, and Fluorine . . . . .	66
Sulphur . . . . .	67
Compounds of Sulphur and Oxygen . . . . .	69
"                    "          Hydrogen . . . . .	72
Questions on Sulphur . . . . .	74
Selenium . . . . .	75
Tellurium . . . . .	76
Silicon . . . . .	76
Boron . . . . .	78
Questions on Silicon and Boron . . . . .	80
Phosphorus . . . . .	80
Compounds of Phosphorus and Oxygen . . . . .	82
Phosphoretted Hydrogen . . . . .	84
Questions on Phosphorus . . . . .	85
Quantitative Chemical Problems . . . . .	88
Exercises . . . . .	88
THE METALLIC ELEMENTS . . . . .	90
Chemical properties of Metals . . . . .	92
Distribution and Classification of Metals . . . . .	94
METALS OF THE ALKALIES :—	
Potassium . . . . .	95
Sodium . . . . .	99
Lithium . . . . .	101
Cesium, Rubidium . . . . .	102
Ammonium . . . . .	102
METALS OF THE ALKALINE EARTHS :—	
Barium . . . . .	106
Strontium . . . . .	106
Calcium . . . . .	107
Magnesium . . . . .	110
Questions on Alkalies and Alkaline Earths . . . . .	112
METALS OF THE EARTHS :—	
Aluminium . . . . .	113
METALS PROPER :—	
Zinc . . . . .	117
Iron . . . . .	120
Manganese . . . . .	123
Cobalt . . . . .	123

CONTENTS.

vii

	PAGE
Nickel . . . . .	129
Chromium . . . . .	131
Copper . . . . .	133
Lead . . . . .	136
Silver . . . . .	140
Mercury . . . . .	142
Bismuth . . . . .	146
Cadmium . . . . .	147
Gold . . . . .	147
Platinum . . . . .	149
Tin . . . . .	150
Antimony . . . . .	153
Arsenic . . . . .	155
Uranium . . . . .	158
Iodine . . . . .	158
Titanium . . . . .	158
Molybdenum . . . . .	158
Tungsten . . . . .	159
Thallium . . . . .	159
Questions on Metals Proper . . . . .	160
Light and Spectrum Analysis . . . . .	163
Hints on Qualitative Analysis . . . . .	167
List of Apparatus, &c., for Analysis . . . . .	169
Directions for the Analysis of Simple Compounds . . . . .	171
Tables of Analysis . . . . .	172
Tables of Weights and Measures . . . . .	181
Index . . . . .	183