

**THE YOUNG CHEMIST: A
BOOK OF LABORATORY
WORK FOR BEGINNERS**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649329069

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

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

JOHN H. APPLETON

**THE YOUNG CHEMIST: A
BOOK OF LABORATORY
WORK FOR BEGINNERS**

THE
YOUNG CHEMIST:

A BOOK OF
LABORATORY WORK

FOR BEGINNERS.

BY

JOHN H. APPLETON, A. M.,

Newport-Rogers Professor of Chemistry in Brown University.

THIS EDITION IS PREPARED FOR

MOWRY & GOFF'S ENGLISH AND CLASSICAL SCHOOL.

DUPLICATE
BROWN UNIVERSITY
LIBRARY.

PROVIDENCE:

J. A. & R. A. REID, PRINTERS

1876.

EducT 228.76.123

✓

HARVARD COLLEGE LIBRARY
BY EXCHANGE, FROM
BROWN UNIVERSITY LIBRARY
NOV 27 1937

Entered according to act of Congress, in the year 1876, by

JOHN H. APPLETON.

In the office of the Librarian of Congress at Washington.

PREFACE.

THE author intends this book for school and college laboratories. He considers that it should be used in connection with a more comprehensive work or with lectures.

The author begs leave to suggest the following course in using the book. Let the teacher perform a given number of experiments, say five of them. Then let the pupil go to his work-bench and perform the same experiments two or three times. At the next exercise, let the pupil be called upon to describe the experiments without the book, and if practicable let him perform them before the teacher.

BROWN UNIVERSITY, October, 1876.

EXPLANATION OF CERTAIN TERMS USED IN THIS BOOK.

- Water-pan.** Any pan holding water. A pan of earthen-ware about 10 inches in diameter, and 3 inches deep.
- Lead saucer.** This is best made from a 2-inch lead waste-pipe by first sawing off a one-inch length, and then soldering on it a lead plate for the bottom of the little cup.
- Bell-glass.** A test-tube is used as a bell glass by filling it full of water, covering it with a slip of paper, immersing the open end in the water of the water-pan.
- Blow-pipe.** A small, bent brass tube, having at one end a very small opening. The ordinary jewelers' blow-pipe answers.
- Blow-pipe-tube.** A very small test-tube made by the experimenter out of Bohemian glass. Take a piece of Bohemian glass tube, quill size, 7 inches in length. Heat it in the middle until the glass softens; now gently draw the ends of the tube apart. Two blow-pipe-tubes are thus made.
- Fluid ounce.** The bulk of one ounce of water. Fluid ounces are measured in *graduates* obtainable of druggists.
- Casserole.** A porcelain dish with a handle.
- Lamp flame.** The blue non-luminous flame of the Bunsen gas lamp. A simple form of the Bunsen burner is sold by all gas-fitters under the name of the *atmospheric burner*. An alcohol lamp will answer.
- Combustion-tube.** A test-tube like a blow-pipe-tube only larger, say eight inches long by $\frac{1}{4}$ -inch internal diameter. It should be made of Bohemian glass.

CONTENTS.

	PAGE.
CHAP. I.—The non-metallic Monads	1
Hydrogen.....	1
Fluorine.....	3
Chlorine.....	4
Chlorohydric Acid.....	6
Bromine.....	6
Iodine.....	7
CHAP. II.—The non-metallic Dyads	9
Oxygen.....	9
Sulphur.....	10
Sulphuric acid.....	11
Sulphuretted hydrogen.....	13
Selenium and Tellurium.....	13
CHAP. III.—The non-metallic Triads	14
Boron.....	14
Nitrogen.....	15
Ammonia-gas.....	15
Nitric acid.....	16
Aqua-regia.....	17
Phosphorus.....	18
Arsenic.....	19
Antimony.....	19
CHAP. IV.—The non-metallic Tetrads	21
Carbon.....	21
Compounds of Carbon and Hydrogen.....	22
Compounds of Carbon, Hydrogen and Oxygen.....	22
Compound of Carbon and Oxygen.....	22
Silicon.....	23
Titanium.....	24
Tin.....	24

CHAP. V.—The metallic Monads.....	26
Silver.....	26
Potassium.....	27
Potassium compounds.....	27
Sodium.....	28
Lithium.....	29
CHAP. VI.—The metallic Dyads, etc.....	30
Lead.....	31
Barium.....	32
Strontium.....	33
Calcium.....	34
Mercury.....	35
Copper.....	37
Magnesium.....	38
Zinc.....	39
Cobalt.....	40
Nickel.....	40
Iron.....	41
Manganese.....	43
Chromium.....	44
Aluminum.....	45
CHAP. VII.—The metallic Triads.....	47
Bismuth.....	47
Gold.....	48
CHAP. VIII.—The metallic Tetrads.....	49
Platinum.....	49
APPENDIX.—List of supplies needed.....	50
INDEX.....	53

CHAPTER I.

THE NON-METALLIC MONADS.

1. Hydrogen is adopted as a monad. In other cases a monad is an element, that (atom for atom) can unite with or take the place of Hydrogen.

2. The non-metallic monads are the following :

<i>Names.</i>	<i>Symbol.</i>	<i>Ordinary condition.</i>	<i>Color.</i>	<i>Atomic weight.</i>
Hydrogen,	H,	gas,	no color,	1.
Fluorine,	Fl,			19.
Chlorine,	Cl,	gas,	green,	35.5
Bromine,	Br,	liquid,	orange red,	80.
Iodine,	I,	solid,	black,	127.

HYDROGEN.

3. The principal *natural* form is in Water, H_2O .
Many *artificial* compounds contain it, thus all acids contain it.

Chlorohydric acid, HCl
Sulphuric acid, H_2SO_4
Nitric acid, HNO_3