

**SELECT METHODS IN
QUANTITATIVE
ANALYSIS, CHIEFLY
INORGANIC**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649286386

Select methods in quantitative analysis, chiefly inorganic by Byron W. Cheever & Frank Clemes Smith

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

BYRON W. CHEEVER & FRANK CLEMES SMITH

**SELECT METHODS IN
QUANTITATIVE
ANALYSIS,
CHIEFLY INORGANIC**

Cc
C51585

UNIVERSITY OF MICHIGAN

SELECT METHODS
IN
QUANTITATIVE ANALYSIS
CHIEFLY INORGANIC

BY
BYRON W. CHEEVER, A. M., M. D.
LATE ACTING PROFESSOR OF METALLURGY IN THE UNIVERSITY OF MICHIGAN

AND
FRANK CLEMES SMITH, E. M.
FORMERLY PROFESSOR OF GEOLOGY, MINING AND METALLURGY IN THE SCHOOL OF
MINES, RAPID CITY, S. D.

FOURTH EDITION. REVISED AND ENLARGED
PARTS I AND II

90390
2118108

PUBLISHED BY
GEORGE WAHR, ANN ARBOR, MICH.
1905

UNIVERSITY OF MICHIGAN

Copyright 1905
by Frank Charles Smith

COPYRIGHT 1905,
BY FRANK CHARLES SMITH.

Copyright 1905
by Frank Charles Smith

PART ONE

LABORATORY NOTES

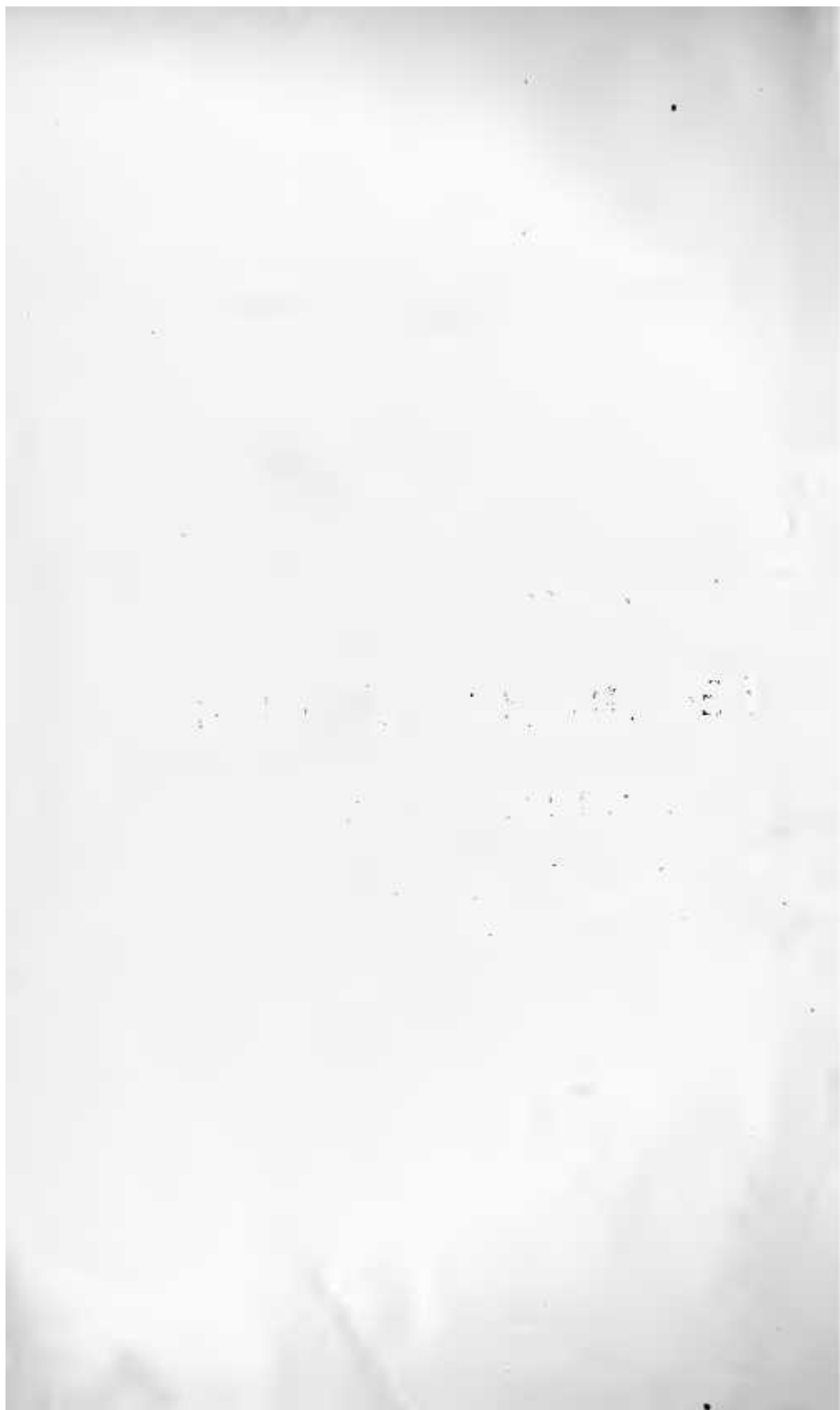
FOR A

BEGINNER'S COURSE

IN

QUANTITATIVE ANALYSIS

ATTENTION IS CALLED TO THE PREFACE



PREFACE TO PART ONE AND NOTICE TO TEACHERS.

As indicated by the title, the first part of this book consists of Laboratory Notes for a Beginners' Course in Quantitative Analysis. It considers the subjects of Gravimetric and Volumetric Analysis, for beginners, by means of the analyses of a set of substances, properly numbered and arranged in what seems to be a desirable order for study, in each case giving the methods to be followed in each analysis; it also gives the methods to be used in calculating and preparing standard solutions for volumetric work, generally following the course offered by Professor Cheever to his students.

Although a number of the methods of analysis given in Part One may be of only approximate accuracy and of small commercial value, such are yet included with a special purpose, to-wit:—that they may supply the student with a diversity of chemical manipulation, at the same time giving him an early opportunity for the necessary careful selection of the methods which he should adopt. This was Professor Cheever's idea, and it is certainly a good one, especially since, in most cases, the work of the beginner simply serves to emphasize the necessity of careful scrutiny of details and methods for practical work in the future.

Part One is then offered as a complete and well-arranged course for elementary students in schools and colleges; and it is intended that students should exactly follow the arrangement in the book, beginning with the subject of Spe-

cific Gravities, continuing with Gravimetric Determinations, Volumetric Analysis and Gravimetric Separations (with such rapidity as may seem advisable to the teacher) and being supplied by the teacher with samples of material for examination, of which a record is kept, whereby the work of the student may be tested as to its accuracy. The subject matter of the book, as taken in its order, will supply abundant material for class questions.

SPECIFIC GRAVITY.*

The specific gravity of a body is the weight of that body as compared with the weight of an equal volume of a standard body, which is taken as unity. In all cases considering the specific gravity of solids and liquids, this standard of unity is pure water at 60° F. = 15.5° C. Water being taken as unity, or one, any other substance will be more or less than one. The results are expressed in whole numbers and decimals; the decimals are carried to the third place.

Water = 1.000 (*one*, not one thousand).

Alcohol = 0.815

Sand = 2.127

Gravimetric Methods of Determining the Specific Gravities of Solids and Liquids.

Before proceeding with the following operations, *read carefully the Rules for Weighing*, as given in the Appendix.

The student should carefully read the following advice:—*Cleanliness, Patience, and the most careful attention to detail are indispensable in chemical manipulations.*

The following classification will serve for all solids and liquids which are likely to occur in ordinary investigations:

*Watt's Dictionary, Vol. 5, page 357.