

NOTES FOR CHEMICAL STUDENTS

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Notes for Chemical Students by Peter T. Austen

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PETER T. AUSTEN

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CHEMICAL
STUDENTS**

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CHEMICAL STUDENTS.

BY
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Polytechnic Institute of Brooklyn.*

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PREFACE.

THIS book is a rewriting of my Chemical Lecture Notes, which was published some years ago, and which has seemed to fill a gap in the literature of chemical teaching. In this rewriting a good deal has been cut out, much has been added, and all has been carefully revised.

It is not intended to be a text-book of chemistry, but to explain and supplement certain topics which experience as a teacher has shown me often give the student more or less trouble, and which are usually not sufficiently considered in the text-books. No attempt has been made to include all the difficulties that may be encountered by the chemical student. It is hoped, however, that some of the subjects considered may prove of interest and value to those students who study not merely to pass, but to know and to think.

P. T. A.

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1

2

CONTENTS.

| | PAGE |
|---|------|
| Classification of the Sciences..... | 1 |
| Volume Relations..... | 3 |
| Weight Relations..... | 6 |
| Molecules..... | 12 |
| Molecular Weights..... | 21 |
| Atoms..... | 23 |
| Combination in Definite Proportions..... | 25 |
| Combination in Multiple Proportions..... | 29 |
| Chemical Reactions..... | 33 |
| The Nascent State..... | 33 |
| Valence..... | 35 |
| Atomicity..... | 39 |
| Absolute Existence of Masses and Molecules..... | 40 |
| Matter and Sensation..... | 43 |
| Smoke-rings and Vortex-atoms..... | 46 |
| Definition of Chemistry..... | 48 |
| The Relation of the Sciences..... | 49 |
| Study of Matter..... | 50 |
| Classification of Reactions..... | 51 |
| Modes of Chemical Action..... | 53 |
| Affinity..... | 53 |
| Substitution or Replacement..... | 58 |
| Rests..... | 60 |
| Binary and Ternary Molecules..... | 61 |
| Nomenclature of Binary Molecules..... | 63 |
| Acids, Bases, and Salts..... | 64 |
| Graphs..... | 72 |
| Stoichiometrical Calculations..... | 74 |
| Weight, Volume, and Specific Gravity in American Meas- ures..... | 74 |
| Water Factors..... | 76 |
| Volume and Weight of Gases..... | 78 |

| | PAGE |
|---|------|
| Molecular and Atomic Relations..... | 80 |
| Specific Gravity of Gases..... | 83 |
| Calculations Involving a Series of Reactions..... | 83 |
| Dilution of Volumetric Solutions..... | 84 |
| Dilution of Percentage of Strength..... | 86 |
| Dilution of Liquids from a Higher Specific Gravity to a Lower..... | 86 |
| Dilution of Liquids from a Lower Specific Gravity to a Higher | 88 |
| Certain Chemical Reactions..... | 89 |
| Sulfurous Acid..... | 95 |
| Permanganic Acid..... | 96 |
| Hydrogen Dioxid..... | 98 |
| Chromic Acid..... | 99 |
| Iodin..... | 99 |
| Hydriodic Acid..... | 100 |
| Arsenic Acid..... | 100 |
| Nitrates and Chlorates..... | 101 |
| Lead and Sodium Dioxid..... | 101 |
| Changes in Valence..... | 102 |

NOTES FOR CHEMICAL STUDENTS.

CLASSIFICATION OF THE SCIENCES.

In all attempts at classification there will occur between the various classes, tracts of No-man's Land of greater or less dimensions, and these not seldom give rise to squabbles between those who wish to rule them. The reason of this is that Nature does not deal with classes. As a matter of convenience certain properties may be selected and used as a basis of classification, but other properties may also be taken, and this will result in an entirely different classification. Thus, the chemical elements may be divided into metals and metalloids, but the distinction is not evident enough to make a clearly defined line of demarcation. The elements present a series. We may divide it into as many groups as we wish, but nothing very exact results. Compare the elements to the keys of a piano. It is a series of terms ascending by gradations; each member stands in certain fixed relations to every other member. Hence an immense number of schemes of classification can be worked out, but they will all be more or less imperfect. Classifications are a great convenience and an absolute necessity to the worker, but they must never be regarded as anything more than working tools. Every particle of matter in the