

**INORGANIC CHEMISTRY  
ACCORDING TO  
THE PERIODIC LAW**

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Inorganic Chemistry According to the Periodic Law by F. P. Venable & Jas. Lewis Howe

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**F. P. VENABLE & JAS. LEWIS HOWE**

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# INORGANIC CHEMISTRY

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TO THE PERIODIC LAW

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BY

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—AND—

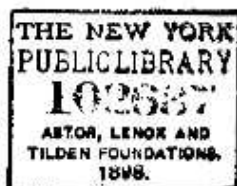
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## PREFACE

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So many text-books of chemistry have appeared in recent years that a new publication should be required to show just cause for its existence. The claim made in behalf of this present book is that it takes the Periodic System for its guiding principle throughout. The Periodic Law has come to be the great central fact of chemistry. It has thrown new light upon the study of the science and is the very best aid to that study. The complete introduction of this system has not been attempted in any text-book that has come to our notice. Some give brief mention of the law and then continue along the old lines as if the law were unknown; others introduce it partially while still clinging to remnants of the old systems.

Following the advice given by Lothar Meyer in his lecture before the German Chemical Society, we have made the experiment of a complete and faithful introduction of this system and the experience of several years with our classes has convinced us of its great value. In no other way have we been able to secure such excellent results both as to thorough, systematic instruction and economy of time. The task is rendered easier for both student and teacher.

The experiments accompanying the text are those

which have been found by experience to impress the subject best upon the student. Elaborate experiments have been omitted because the time for laboratory work is usually limited and because the manipulation of such experiments tends often to distract the attention of the beginner from the principle or fact which is to be emphasized. One hour of laboratory work in connection with each lecture has been found ample time for these experiments with most college students. The experiments should be performed under the immediate supervision of an instructor and the notes kept by the student should clearly set forth what each experiment is intended to illustrate.



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## PART I

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### INTRODUCTION

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1. **Chemistry** is the study of matter and the changes produced in that matter by the action of chemical force upon it.

2. **Matter** is that which occupies space. We become sensible of its existence in mass through one or more of the senses. Thus a piece of chalk, wood, iron, a volume of water, the air around us, are all forms of matter.

There are three divisions of matter : *mass*, *molecule*, and *atom*.

3. **Mass** is any form of matter which is appreciable to the senses. The illustrations of matter given above were all masses of matter. These masses are made up of a great number of very small particles.

4. **The Molecule** is the smallest particle of matter which still retains the properties of the mass. It is too small to be appreciable to the senses. There are as many different kinds of molecules as there are kinds of mass. These particles, even in apparently rigid masses, are supposed to be in incessant and rapid motion. A molecule may be further defined as the smallest particle of matter capable of independent existence.

5. **The Atom** is the smallest subdivision of matter. Atoms are themselves indivisible. They unite to form molecules. They are, as a rule, incapable of independent existence. There are some seventy different kinds of