

Review

## **INORGANIC CHEMISTRY - PRACTICAL AND NUMERICAL APPLICATIONS I, AUTHORS: MIHAIL BÎRZESCU, MIRCEA NICULESCU – EDITURA DE VEST, TIMIȘOARA, 2014, ISBN 978-973-36-0610-9**

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“**Chimie anorganică**” (“**Inorganic Chemistry**”), a book by Mihail Bîrzescu and Mircea Niculescu, is a much awaited and valuable contribution to the reinforcement of the prestigious tradition of Timișoara’s school of Inorganic Chemistry, founded and strengthened by Acad. Prof. Coriolan Drăgulescu and continued by Prof. Emil Petrovici and their collaborators. The treatises “*Introducere in chimia anorganică modernă*” (“*Introduction to modern inorganic chemistry*”) and “*Chimie structurală modernă. Chimia coordinației 8*” (“*Modern structural chemistry. Eight-coordination chemistry*”) (C. Drăgulescu, E. Petrovici: 1973-1978) enjoyed a remarkable success, being seen as reference works in the current scientific community and being consulted with interest by students and researchers in the field.

After four decades, the authors of the current work, having a long teaching and scientific activity carried out at the Faculty of Chemical Engineering and Environmental Protection from Timișoara, with a rich and representative list of papers, capitalize through this book their gathered experience concerning the innovation in the educational process, being in fact one of its reorientations in which the transmission of knowledge involves the participation of the subjects concerned with their professional training.

The book “**Chimie anorganică**” is conceived by Mihail Bîrzescu and Mircea Niculescu in line with the demands of modern methodology, the immense material of scientific information in the field being selected by criteria that integrates and harmonizes the fundamental knowledge with the new progress in theoretical and applied specialty research. The paper is the result of a laborious work, having as outstanding performance the editing in coherent, essential and systematic form of the principles, of the concepts that enable a rational characterization, a judicious selection of a vast amount of descriptive data about the elements and their compounds, based on their physical and chemical properties.

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The authors' effort is considerable, given that in the last two decades the evolution of inorganic chemistry faced the "pessimism" of the ones announcing the decline of this field, with the appearance of a huge number of organic substances which have a very broad spectrum of applications, synthesized in the second half of the past century. These skeptical projections were canceled by the performant research, with theoretical and applied consequences of particularly importance, through which inorganic chemistry has changed dramatically due to the deep, interactive intersection with physical chemistry, solid state physics, organic chemistry, biochemistry, and also due to the application of physical-chemical methods of modern instrumental analysis. The highlighted interdependencies motivate the fact that interdisciplinarity is not simply a methodological and epistemological option any longer, but an essential need for the advancement of knowledge and contemporary research.

In the work they developed, the authors consider the fact that the thematic portfolio that interests today's inorganic chemistry enriched unexpectedly, requiring an update of both the knowledge and of the learning process, according to the new research and application directions of inorganic chemistry. The products created by the nowadays "amazing chemistry" include not only compounds, but also materials that contain, in addition to inorganic components, organic, polymeric and biopolymeric structures (fragments). This requires the study of inorganic chemistry at different levels of depth, of relationshipness and specification in a multiform and dynamic context. Thus, in addition to knowing the molecular and crystalline structure of substances, these must also be studied from electronic and magnetic points of view, and the microimpurities distribution must be also determined, together with the study of the structure of interfaces in polycrystalline materials, of the nanostructure, of the micro- and mesopore structure, as well as of all the various influences over the substances' properties.

Based on their wide teaching and methodological experience, the authors manage a logical and efficient "assembly" of the study of theoretical principles with the practical applications, laboratory experiments, exercises and problems designed for each chapter.

Through a modern approach, the nature and the formation mechanism of chemical bonds resulting from interatomic interactions are exposed, as energetic expression of the natural tendency of elements and of chemical compounds to gain stability in a reactive field.

The first chapters are devoted to the principles and laws that govern the quality and quantity of reactions of chemical elements and their compounds. In an original manner, the exposure of chemical reactions classification principles is based on the relationship between the acid-base, redox, solubility and complexation properties, and the behavior of the reactive chemical system as a whole.

A special chapter is devoted to the ample presentation of hydrogen and its compounds, the former being considered as the reference element for interpreting the properties and the reactivity, starting from the structure of the atom. The laboratory experiments and the related numerical applications consolidate and test the accumulation of knowledge.

The bibliography includes references to the most recognized inorganic chemistry treaties and books, both classic and modern, enshrined through their scientific and methodological value.

Finally, for those who do not know, Mihail Bîrzescu and Mircea Niculescu's book is a part of the students' first year chemistry course in a compressed and somewhat standardized form of university lectures. Oral exposition accents and the unique ad-hoc correlations made

through the direct dialogue with the students are thus absent, aiming not simply the transmission of knowledge about chemical processes, but stimulating a proper and independent thinking and action. Yet the book has as target a much wider audience, being a welcomed (and hopefully well received) guide for those who want to get into this “*Periodic Kingdom*” of elements, because, as Professor P.W. Atkins says: “*We stand on the elements, we eat the elements, we are the elements.*”