

PRIKAZI KNJIGA

BOOK REVIEWS

Smiljko Ašperger

Kemijska kinetika i anorganski reakcijski mehanizmi

[Chemical Kinetics and Mechanisms of Inorganic Reactions]

Hrvatska akademija znanosti i umjetnosti [Croatian Academy of Sciences and Arts],
Zagreb, 1999, 349 pp.
ISBN 953-154-380-1 (hard cover).

This monograph deals with an important field of coordination chemistry, *viz.* kinetics and mechanisms of the reactions of the complexes of metal ions (or metal atoms), mostly in solution. The author – Professor Smiljko Ašperger, former professor of physical chemistry at the University of Zagreb, Croatia (Faculty of Pharmacy and Biochemistry) – has been active in the field covered by the book for more than 50 years and his research work is certainly well known to many coordination chemists, especially in the US and UK. His book is the first monograph on inorganic reaction kinetics written in the Croatian language.

The book is divided into thirteen chapters, the first six being mainly of fundamental chemical interest: *Chemical kinetics and reaction mechanisms* (basic definitions, collision and transition-state theories, types of mechanisms of substitution reactions [98 pp.]); *Substitution reactions of metal complexes* (classical octahedral, tetrahedral and square-planar complexes, catalytic reactions [52 pp.]); *Oxidative additions and reductive eliminations* [8 pp.]; *Molecular non-rigidity and pseudorotation* [14 pp.]; *Electron transfer reactions* [24 pp.]; *Reactions of free radicals* [18 pp.]. The last chapter, *Dendrimers* [3 pp.], is also more of fundamental interest although the possible practical uses of this new class of compounds can hardly be foreseen at present (the first dendrimer was synthesized in 1978).

The remaining chapters (except for Ch. 10) deal with topics of bioinorganic and/or medical interest: *Mechanism of vitamin B₁₂ action* [14 pp.]; *Kinetics and mechanisms of reactions of metalloporphyrines* [34 pp.]; *Metalloenes – strong electron-donors* [18 pp.]; *Complex intermediates in chemical and biological nitrogen fixation* [8 pp.]; *Metallo-organic compounds in chemotherapy* [12 pp.].

Chapter 10 (*Heterogeneous and homogeneous catalysis by metals and metal complexes* [12 pp.]) is focused on some processes important to chemical industry, for instance hydroformylation, hydrocyanation, carbonylation of methanol, polymerization of alkenes and alkynes (Ziegler & Natta), ...

In addition to a carefully compiled index, the appendices contain a list of standardized (IUPAC recommended) abbreviations of ligands' names, as well as tables of SI prefixes, physical and chemical constants, unit conversion factors, and electronic configurations of the elements.

Although the selection of topics to be reviewed necessarily depends on the author's own experience and preferences, the coverage of the field is here reasonably wide, systematic and competent. Literature references are abundant and up-to-date. Some of the topics have been given more weight, reflecting the writer's scientific profile of a physical-inorganic chemist, having extensive experience in and a deep understanding of substitution reactions, with a strong inclination towards bio-inorganic, physiological and medical aspects of coordination chemistry.

The general scientific level of the monograph is comparable to similar books published by renowned publishers and aiming at an international audience. This reviewer is convinced that Ašperger's book deserves an English translation, which would make it accessible to substantially wider circles of chemists.

Viewed from a narrower, national angle, this book is certainly an important contribution to Croatian chemical literature. It will be extremely useful to final-year and graduate students of chemistry, as well as to the researchers. Besides, it will certainly have an impact upon Croatian chemical terminology.

Vladimir Simeon