

Preface

Story has that Henry Taube, shortly before winning the 1983 Nobel Prize in chemistry, considered his life's work a failure. The reason why he felt so was that he did not write a textbook on inorganic chemistry. Instead, Al Cotton's textbook became widely popular, whose text had the main emphasis on structure instead of reactivity, which Taube did not like at all. Even if the story is not true, its message is crystal clear: writing a textbook gives the author a chance to influence the scientific thinking of future generations.

Another Nobel Laureate, Roald Hoffmann, wrote quite eloquently about some scientists' "desire to convince, to scream, 'I'm right, all of you are wrong', clashing with the established rules of civility supposedly governing scholarly behavior" in his book titled *The same and not the same*. This burning feeling is indeed very familiar to the present author, who encounters scientific lines of thought that he believes to be incorrect daily.

This book is my brief account of chemical kinetics. It mainly presents how kinetic curves should be evaluated and how kinetic experiments can be designed to maximize their information content. There should only be one good reason to write a book: to say something that has never been said before. Yet, textbooks on chemical kinetics are available in a considerable variety. Why do I think my book is unique then?

I hope the reader did not expect a short answer to the previous question. I was fortunate enough to reinvent (established rules of scholarly civility oblige me to use this word, but the actual feeling at the time always was the excitement of invention) many ways to solve kinetic problems. Some of these problems are quite common; others are curiosities even for experts. After some time, a few of my colleagues took notice of this fact and began asking occasional questions, most of which I could answer. This process has been on for a long enough time now to convince me that this expertise may help other scientists in their work. Therefore, in this book, I tried to summarize these problem-solving strategies in a systematic way. The text introduces the basic concepts of chemical kinetics but typically also contains my personal opinion as well. The reader will probably be surprised by some of the remarks as I did not refrain from criticizing kinetic techniques that I consider

wrong despite the fact that they have a long history and would probably qualify as “accepted practice” for many scientists. Logic tells me that mathematical derivations or proofs are not a matter of opinion or acceptance, they are either right or wrong (although any person can make a mistake in judgment). My personal opinion, on the other hand, may and hopefully, will be debated.

I intended this book to be a bridge between theoreticians and experimentalists. For theoreticians, the text tries to present the practical significance of concepts and mathematical techniques, always explaining how the assumptions made relate to physical reality. On the other hand, I felt that it would be useful for experimentalists to have a much wider picture of mathematical possibilities than that available in their commonly used textbooks.

I kept the number of literature references intentionally low in this book. This is intended as a service to the reader. In our Internet age, searching in the scientific literature has become very easy. A much more difficult task is assessing the search results in terms of reliability and significance. My objective was to write a book that can be understood and used without checking any of the previous literature. References usually serve one of two purposes (sometimes both): (1) To pinpoint a source that provides mathematical proofs or other background information, which I do not see as vital, but may be useful for an advanced reader. (2) To acknowledge the priority of a scientist who is widely believed to introduce a certain concept.

All the derivations and mathematical lines of thought presented in this text have been meticulously repeated by the author; nothing was simply taken from the literature without rethinking and cross-checking. The result is that the author is responsible for any possible mistakes in this book: hopefully, these are typos only and not failures of logical thinking.

This book tries to present how kinetic measurements are best done and evaluated in modern research. It could be ironic that the author, or indeed any living person, feels entitled to undertake such a task. The only excuse for this gross immodesty can be that scientists (young or more experienced alike) might benefit from reading the results of this effort—the book.

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