

Preface

The field of catalysis, especially heterogeneous catalysis, involves the utilization of knowledge from various disciplines, including chemical engineering, chemistry, physics, and materials science. After more than two decades of teaching a graduate course in catalysis, whose membership was comprised primarily of students from the above programs, and consulting with numerous industrial researchers, it became apparent to me that a book would be useful that focused on the proper acquisition, evaluation and reporting of rate data in addition to the derivation and verification of rate equations based on reaction models associated with both uniform and nonuniform surfaces. Such a book should familiarize and provide its reader with enough background information to feel comfortable in measuring and modeling heterogeneous catalytic reactions. For a single individual to attempt such an undertaking is almost a guarantee that some issues will be addressed less adequately than others; regardless, I hope that these latter topics will meet minimum standards! My goal is a text that will be self-contained and will provide a convenience for the practitioner in catalysis.

I would first like to acknowledge here the people who have been most influential in my life and have inspired me to this point in my career, whereupon I have been willing to undertake the effort to write this book (which is bound to reveal some of my deficiencies, I am sure!). Clearly, I must thank my parents who, during the time I attended a small high school of 19 students in Nebraska, always had me oriented towards a college education. Second, I gratefully acknowledge my graduate school mentor, Professor Michel Boudart, who created my interest in kinetics and catalysis and instilled in me the necessity of accurate, reproducible data. Third, I note my friends from graduate school, especially Professor Nicholas Delgass, who have continued to educate me during the past three decades. (They have upheld the old adage that one should never stop learning.) Fourth, I must mention my graduate students, who have provided me much pleasure, not only in their accomplishments as we worked together, but also in the successes they have subsequently achieved. In particular, I would like to express special appreciation to one of them, Dr. Paul E. Fanning, who

graciously volunteered his time to very carefully proofread this textbook and offer valuable suggestions. Also, I would like to acknowledge the review of Chapter 6.3 and the comments offered by Dr. Evgeny Shustorovich, both of which were greatly appreciated. Next, I would like to thank my secretary, Kathy Peters, for her patience and persistence during the time she typed the drafts of these chapters as they traveled, at times uncertainly, via air mail between Alicante, Spain and Penn State. I must also express my gratitude to Professor Francisco Rodriguez-Reinoso for his hospitality at the University of Alicante during my one-year sabbatical stay there to write this book. Last, but certainly not least, I sincerely thank my wife, Bette Ann, for her patience and understanding during the many days and nights I was absent during the past three decades while working in the lab to establish a research program or attending necessary scientific meetings (invariably on her birthday!). She was also kind enough to offer her secretarial skills and proofread this book from a grammatical perspective.



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