Acid-Base Diagrams

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Springer

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English edition of "Säure-Base-Diagramme" (Springer Spektrum), 2013, ISBN 978-3-642-37703-7

ISBN 978-3-642-37901-7 ISBN 978-3-642-37902-4 (eBook)
DOI 10.1007/978-3-642-37902-4
Springer Heidelberg New York Dordrecht London

Library of Congress Control Number: 2013943686

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

This book is dedicated to Prof. Dr. Günter Henrion on the occasion of his 80th birthday. It is an expression of esteem for an inspirational teacher, who first sparked our love of pH-logc_i diagrams during our chemistry studies at Humboldt University, Berlin.

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Preface

The understanding of acid–base equilibria is of basic importance for chemistry, and thus also for biochemistry, biology, environmental sciences, etc. Hardly any chemical technique, any biochemical process, any environmental phenomenon can be understood without a profound knowledge of the underlying acid–base equilibria on a quantitative basis. However, even for the simplest chemical systems the mathematical calculations can be rather complicated, and the desire will arise to describe the systems by well-chosen approximations. For all these requirements there is one powerful means, the so-called acid–base diagrams (pH-logc_i diagrams), which permit a simple presentation of the dependencies of the concentrations of all participating species as a function of pH of the aqueous solutions. With their help, it is easy to find the possible simplified equation which permits a straightforward calculation of special cases. These diagrams also permit the construction of titration diagrams. The present book is the result of the many years of teaching experience of the authors, during which they have learned what the usual problems of understanding are which students have in using these diagrams. The book has been written because there was no other textbook which presented the fundamentals and applications of pH-logc_i diagrams in the necessary depth *and* with the desired simplicity. It was not the goal to describe these diagrams comprehensively with all imaginable special cases, but the authors had the aim of giving clear and straightforward instruction on how to construct and use these tools for problem-solving. We hope that this book will guide students of chemistry, biochemistry, biotechnology, biology, pharmacy, physics, environmental sciences, geosciences, hydrology, medicine, etc. in their attempts to handle acid–base equilibria.

Greifswald
January 2013

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