## Contents

1 Introduction ........................................... 1  
   Literature ........................................... 2  

2 The Math Behind the pH-log$c_i$ Diagrams ............... 5  
   Literature ........................................... 18  

3 Constructing pH-log$c_i$ Diagrams ......................... 19  
   3.1 Monobasic Acids .................................... 19  
   3.2 Dibasic Acids ..................................... 22  
   3.3 Tribasic Acids ..................................... 25  
   3.4 Tetrabasic Acids ................................... 29  

4 The Application of pH-log$c_i$ Diagrams for Graphical Estimation of the pH of Solutions and for the Derivation of Useful Simplified Equations ............................................. 33  
   4.1 Monobasic Acids and Their Corresponding Bases .......... 36  
      4.1.1 Very Strong Acids and Their Corresponding Very Weak Bases .................................... 36  
      4.1.2 Strong Acids and Their Corresponding Weak Bases .... 40  
      4.1.3 Weak Acids and Their Corresponding Strong Bases ... 46  
      4.1.4 Very Weak Acids and Their Corresponding Very Strong Bases .................................. 51  
      4.1.5 Ranges of Validity of the Simplified Equations for Monobasic Acids ......................... 55  
   4.2 Dibasic Acids, Ampholytes, and Diacidic Bases .......... 56  
      4.2.1 Dibasic Acids .................................... 56  
      4.2.2 Simplified Equation for Ampholytes ............... 62  
      4.2.3 Diacidic Bases .................................. 68  
   4.3 Salt Solutions with Protolyzing Anions and Cations ...... 72  
   4.4 Examples ......................................... 76  
      4.4.1 The pH-log$c_i$ Diagram of Water .................. 76  
      4.4.2 Acetic Acid/Acetate ................................ 77  
      4.4.3 Hydrogen Sulfide .................................. 78
Acid-Base Diagrams
Kahlert, H.; Scholz, F.
2013, X, 136 p. 104 illus., 78 illus. in color., Hardcover
ISBN: 978-3-642-37901-7