

# Contents

## Session 1. Introduction

|  |  |   |
|--|--|---|
|  | <i>Jerry L Hamelink, Peter F. Landrum, Harold L Bergman, William H. Benson</i> ..... | 1 |
|--|--|---|

## Session 2. Water Chemistry

|           |  |    |
|-----------|--|----|
| Chapter 1 | Physicochemical Factors Affecting Toxicity in Freshwater: Hardness, pH, and Temperature .....  | 5  |
|           | <i>Foster L. (Sonny) Mayer, Jr., Leif L. Marking, Terry D. Bills, and George E. Howe</i>   |    |
| Chapter 2 | Chemical and Biological Factors Affecting Bioavailability of Contaminants in Seawater .....  | 23 |
|           | <i>John P. Knezovich</i>   |    |
| Chapter 3 | Synopsis of Discussion Session on Physicochemical Factors Affecting Toxicity .....   | 31 |
|           | <i>Russell Erickson (Chair), Terry D. Bills, James R. Clark, David Hansen, John P. Knezovich, Foster L. Mayer, and Anne E. McElroy</i> |    |

## Session 3. Inorganic Toxicants

|           |  |    |
|-----------|--|----|
| Chapter 1 | Ligands and the Bioavailability of Metals in Aquatic Environments .....                                      | 39 |
|           | <i>Michael C. Newman and Charles H. Jagoe</i>  |    |
| Chapter 2 | Synopsis of Discussion Session on the Bioavailability of Inorganic Contaminants .....                        | 63 |
|           | <i>William H. Benson (Chair), James J. Alberts, Herbert E. Allen, Carlton D. Hunt, and Michael C. Newman</i> |    |

## Session 4. Organic Toxicants

|           |  |    |
|-----------|--|----|
| Chapter 1 | Interactions of Organic Pollutants with Inorganic Solid Phases: Are They Important to Bioavailability? .....                           | 73 |
|           | <i>Anne Spacie</i>   |    |
| Chapter 2 | Interactions of Organic Chemicals with Particulate and Dissolved Organic Matter in the Aquatic Environment .....                       | 83 |
|           | <i>Frank A. P. C. Gobas and Xin Zhang</i>  |    |
| Chapter 3 | Synopsis of Discussion Session: Influences of Particulate and Dissolved Material on the Bioavailability of Organic Compounds .....     | 93 |
|           | <i>I. H. (Mel) Suffert (Chair), Lisa L. Williams, Chad T. Jafvert, Jussi Kukkonen, Mark R. Servos, Anne Spacie, and James A. Noble</i> |    |

## Session 5. Dynamic Environmental Factors

|           |   |
|-----------|---|
| Chapter 1 | Photochemical Aspects of Bioavailability ..... 109<br><i>Donald G. Crosby</i>   |
| Chapter 2 | Effects of Redox Processes on Acid-Producing Potential and Metal<br>Mobility in Sediments ..... 119<br><i>Jihua Hong, Ulrich Förstner, and Wolfgang Calmano</i>   |
| Chapter 3 | Sediment-Water Exchange Processes ..... 143<br><i>Bjom Sundby</i>   |
| Chapter 4 | Synopsis of Discussion Session: The Effects of Variable Redox<br>Potentials, pH, and Light on Bioavailability in Dynamic Water-Sediment<br>Environments ..... 155<br><i>Joseph S. Meyer (Chair), William Davison, Bjom Sundby, James T. Oris,<br/>Darrel J. Laurén, Ulrich Förstner, Jihua Hong, and Donald G. Crosby</i> |

## Session 6. Kinetic Limitations or Dissolution

|           |  |
|-----------|--|
| Chapter 1 | Unraveling the Choreography of Contaminant Kinetics: Approaches to<br>Quantifying the Uptake of Chemicals by Organisms ..... 171<br><i>Donald Mackay</i>   |
| Chapter 2 | Physiological and Biochemical Mechanisms that Regulate the<br>Accumulation and Toxicity of Environmental Chemicals in Fish ..... 179<br><i>James M. McKim</i>  |
| Chapter 3 | Synopsis of Discussion Session on the Kinetics Behind Environmental<br>Bioavailability ..... 203<br><i>Peter F. Landrum (Chair), William L. Hayton, Henry Lee II, and<br/>Lynn S. McCarty, Donald Mackay, and James M. McKim</i> |

## Session 7. Closing Remarks

|       |  |
|-------|--|
|       | Summary and Conclusions ..... 221<br><i>Kenneth L. Dickson (chair), John P. Giesy, Rodney Parrish, and<br/>Lee Wolfe</i> |
| Index | ..... 231  |