Contents

Part I  Globalization and Chemical Education
   Mei-Hung Chiu

Dissemination of Achievements in Chemical Education (Research)
via EU Projects ........................................................................................................ 3
Anna Kolas and Iwona Maciejowska

Polish Education Reform and Resulting Changes
in the Process of Chemical Education ................................................................. 15
Hanna Gulińska

Part II  Learning and Conceptual Change in Chemistry
   Jing-Wen Lin

Assessment of Chemistry Anxiety Among College Students ....................... 27
Chen@Chong Sheau Huey

Teacher-Student Interactions: The Roles of In-Class
Written Questions ................................................................................................... 35
Liliana Mammino

Probing and Fostering Students’ Reasoning Abilities
with a Cyclic Predict-Observe-Explain Strategy .............................................. 49
Jia-Lin Chang, Chiing-Chang Chen, Chia-Hsing Tsai, Yong-Chang Chen,
Meng-Hsun Chou, and Ling-Chuan Chang

A Trial of Placement and Embodiment of Images
for Chemical Concepts in the Lesson Model
of a “Surface Active Agent” Through SEIC ....................................................... 59
Haruo Ogawa and Hiroki Fujii
### Part III  Teaching Chemistry

**Hsiao-Lin Tuan**

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry Pre-service Teachers’ Mental Models of Science Teaching and Learning in Malaysia</td>
<td>73</td>
</tr>
<tr>
<td>Maryam Sulaiman and Zurida Haji Ismail</td>
<td></td>
</tr>
<tr>
<td>Chemistry Teachers Enhance Their Knowledge in Contemporary Scientific Areas</td>
<td>85</td>
</tr>
<tr>
<td>Rachel Mamlok-Naaman, Ron Blonder, and Avi Hofstein</td>
<td></td>
</tr>
<tr>
<td>Practical Science Activities in Primary Schools in Malaysia</td>
<td>97</td>
</tr>
<tr>
<td>Norita Mohamed, Mashita Abdullah, and Zurida Haji Ismail</td>
<td></td>
</tr>
<tr>
<td>Teaching Chemistry Effectively with Engineering Majors: Teaching Beyond the Textbook</td>
<td>109</td>
</tr>
<tr>
<td>Yermesha Kyle, Stephen Bacon, Amber Park, Jameka Griffin, Raicherylon Cummins, Raymond Hooks, Bailu Qian, and Hua-Jun Fan</td>
<td></td>
</tr>
<tr>
<td>Problem-Based Learning as an Approach to Teach Cell Potential in Matriculation College, Malaysia</td>
<td>121</td>
</tr>
<tr>
<td>Kai-Li Teh and Nooraida Yakob</td>
<td></td>
</tr>
<tr>
<td>Teaching Catalysis by Means of Enzymes and Microorganisms</td>
<td>131</td>
</tr>
<tr>
<td>Peter Grunwald</td>
<td></td>
</tr>
<tr>
<td>The Application of the SATL in Biochemistry</td>
<td>145</td>
</tr>
<tr>
<td>Suzana B. Golemi</td>
<td></td>
</tr>
</tbody>
</table>

### Part IV  Curriculum and Assessment in Chemistry Education

**Mei-Hung Chiu**

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Alignment Analysis of Junior High School Chemistry Curriculum Standards and City-Wide Exit Exams in China</td>
<td>157</td>
</tr>
<tr>
<td>Hongjia Ma, Gavin W. Fulmer, Ling L. Liang, Xian Chen, Xinlu Li, and Yuan Li</td>
<td></td>
</tr>
<tr>
<td>A National Survey of Students’ Conceptions and Their Sources of Chemistry in Taiwan: Examples of Chemical Equilibrium and Acids/Bases</td>
<td>171</td>
</tr>
<tr>
<td>Jing-Wen Lin and Mei-Hung Chiu</td>
<td></td>
</tr>
<tr>
<td>The Use of Electronic Media for Chemical Education Research</td>
<td>185</td>
</tr>
<tr>
<td>Francis Burns and David Frank</td>
<td></td>
</tr>
<tr>
<td>Investigation of Tertiary Chemistry Learning Environment in Sabah, Malaysia</td>
<td>197</td>
</tr>
<tr>
<td>Yoon-Fah Lay and Chwee-Hoon Khoo</td>
<td></td>
</tr>
</tbody>
</table>
The Evaluation of Chemistry Competence for Freshmen at Technology Colleges in Taiwan ................................................................. 211
Ji-Chyuan Yang, Ching-Yun Hsu, Wen-Jyh Wang, Chia-Hui Tai, Hong-Hsin Huang, and Ping-Chih Huang

Changes in Teachers’ Views of Cognitive Apprenticeship for Situated Learning in Developing a Chemistry Laboratory Course ................................................................. 221
Hui-Jung Chen and Mei-Hung Chiu

Part V E-learning and Innovative Instruction
Hsin-Kai Wu

Application of Mind Maps and Mind Manager to Improve Students’ Competence in Solving Chemistry Problems .................. 235
Zhen Lu, Zheng Zou, and Yitian Zhang

An Integrated-ICT Assessment for College Students’ Performances of Chemical Learning ................................................................. 247
King-Dow Su

Academic Performance and Attitude Toward Computer-Aided Instruction in Chemistry ................................................................. 257
Ronaldo C. Reyes

Integrating Instant Response System (IRS) as an In-Class Assessment Tool into Undergraduate Chemistry Learning Experience: Student Perceptions and Performance .................. 267
Tzy-Ling Chen, Yan-Fu Lin, Yi-Lin Liu, Hsiu-Ping Yueh, Horn-Jiunn Sheen, and Wei-Jane Lin

Part VI Microscale Lab Chemistry
Chin-Cheng Chou

Aqueous Cationic and Anionic Surfactants for Microscale Experiments in Organic Chemistry Teaching Laboratories .................. 279
Masayuki Inoue, Yuko Kato, Emi Joguchi, and Wataru Banba

Development of an Analytical Method of Gaseous Mixtures Using a Syringe ................................................................. 293
Takashi Yasuoka

Microscale Experiments Using a Low-Cost Conductance Meter .......... 303
Jose H. Bergantin, Jr., Djohn Reb T. Cleofe, and Fortunato Sevilla III

Introducing Microscale Experimentation in Volumetric Analysis for Pre-service Teachers ................................................................. 311
Mashita Abdullah, Norita Mohamed, and Zurida Haji Ismail
Innovative Techniques in Microscale Chemistry Experiments ................... 321
Kwok Man Chan

Microscale Experiment on Decreases in Volume When Forming
Binary Liquid Mixtures: Four Alkanol Aqueous Solutions ....................... 335
Tetsuo Nakagawa

Index ................................................................................................................. 347
Chemistry Education and Sustainability in the Global Age
2013, XII, 352 p., Hardcover
ISBN: 978-94-007-4859-0