Table of Contents

Preface .......................................................................................................................... V

Part I: The Chemical Industry ................................................................. 1

1 The Global Chemical Industry .......................................................... 3
   Gunter Festel
   1.1 Some Basic Facts About the Chemical Industry ....................... 3
   1.2 Transformation of the Chemical Industry ............................... 4
   1.3 Impact of Industrial Biotechnology ......................................... 7

2 The Petrochemical Industry in China ............................................. 9
   Jörg Wuttke
   2.1 Major Players in the Chinese Chemical Industry .................. 9
   2.2 Underpinning Economic Growth and the Energy Bottleneck .... 10
   2.3 Outlook for Feedstock Supply ........................................... 13
   2.4 Cracker Capacity Development .......................................... 14
   2.5 Consumption of Ethylene and its Derivatives ....................... 15
   2.6 WTO Entry and Its Impact on China’s Petrochemical Industry .. 18
   2.7 Competitive Environment in the Chinese Market ................. 19
   2.8 Summary and Outlook ....................................................... 22

3 Activities of European Chemical Companies in China ............. 23
   Heinz Mueller
   3.1 Executive Summary .............................................................. 23
   3.2 Activities in China .............................................................. 24
   3.3 Investment in China ........................................................... 27
   3.4 Focus on Subsegments ......................................................... 30
   3.5 Effects of Investment and Positioning on Sales ..................... 37
   3.6 Selected Chemical Companies in China ............................... 39

4 Research and Development in China .......................................... 47
   Gunter Festel, Harald Pielartzik and Martin S. Vollmer
   4.1 Scope and Structure of R&D in China ................................ 47
   4.2 R&D by Foreign Chemical and Pharmaceutical Companies .... 50
   4.3 Conclusion and Outlook ..................................................... 52

5 Chemical Industry Parks in China ................................................. 53
   Gunter Festel and Yong Geng
   5.1 Industrial Parks and Their Infrastructures ............................ 53
VIII Table of Contents

5.2 Site Selection Criteria ......................................................... 55
5.3 Important Aspects for Foreign Investors ............................. 57
5.4 Selected Chemical Industry Parks in China ......................... 59

6 Trends in the Chinese Fine Chemicals Market – Opportunities and
Threats for the European Fine Chemicals Industry .................... 63
Dahai Yu

6.1 General Introduction to the Fine Chemicals Market ............... 63
6.2 The Chinese Fine Chemicals Industry and Recent Developments ... 65
6.3 Scenarios for Future Developments .................................... 69
6.4 Opportunities and Threats to the European Fine Chemicals Industry... 70
6.5 Conclusion ........................................................................... 71

7 Chemicals for China’s Chip Industry .................................. 73
Klaus Griesar

7.1 The Semiconductor Industry – Market Growth ...................... 73
7.2 Technological Innovation in the Microchip Industry .............. 74
7.3 Electronics Chemicals and Semiconductor Manufacturing ...... 75
7.4 Semiconductor Industry to Get Boost in China ................... 80
7.5 China Promises Great Potential, but Plenty of Pitfalls ........... 84
7.6 Electronics Chemicals in China ............................................ 85

Part II: The Pharmaceutical Industry in China ...................... 89

8 China’s Pharmaceutical Market: Business Environment and
Market Dynamics ...................................................................... 91
Michael Brueckner, Marc P. Philipp and Joachim E. A. Luithle

8.1 Introduction ........................................................................... 91
8.2 Business Environment for the Pharmaceutical Industry in China.. 92
8.3 Market Characteristics and Dynamics of China’s
Pharmaceutical Industry ............................................................. 95
8.4 Conclusion and Outlook ....................................................... 107

9 Developing the Pharmaceutical Business in China – The Case
of Novartis .............................................................................. 109
Angela Wang and Maximilian von Zedtwitz

9.1 Changing Pharmaceutical Environment in China ................. 109
9.2 Novartis Pharma in China .................................................... 110
9.3 Strategic vs. Potential Regions in China .............................. 112
9.4 Analyzing the Pharmaceutical Business Environment .......... 114
9.5 Conclusion .......................................................................... 119
Table of Contents

10 China’s Approach to Innovative Pharmaceutical R&D: A Review 121
   David E. Webber
   10.1 Chinese Pharmaceutical R&D – Current Status 121
   10.2 Government Agencies Driving Biopharmaceutical R&D 124
   10.3 Factors Important in Country Competitiveness in
       Pharmaceutical R&D 126
   10.4 Collaboration with the Multinational Pharmaceutical Companies 129
   10.5 Conclusion 131

11 Foreign Direct Investment by Multinational Corporations
   in China – The Pharmaceutical Sector 133
   Xiangdong Chen and Guido Reger
   11.1 Introduction 133
   11.2 Foreign Direct Investment (FDI) in the Pharmaceutical Sector
       in China: Trends and Structures 133
   11.3 Technology, Patents and Foreign Direct Investment in China
       by Multinational Pharmaceutical Companies 143
   11.4 Conclusions 146

12 Competing in the Chinese Antibiotics Market – Cephalosporins
   1982-2000 149
   Gail E. Henderson and William A. Fischer
   12.1 Cephalosporins and China 149
   12.2 The Business of Antibiotics in China, Early 1980s 150
   12.3 Market Changes from the Mid-1980s 151
   12.4 Characteristics of the Chinese Market for Cephalosporins:
       Late 1990s 153

Part III: The Experience of Successful European
Companies in China 157

13 Swimming Ahead of the Shoal – The History of BASF
   in Greater China 159
   Andreas Kreimeyer
   13.1 The Founding of BASF 159
   13.2 A Partnership Sealed by Colors 160
   13.3 The Two World Wars 161
   13.4 The Postwar Era 161
   13.5 Towards the Future 167
X Table of Contents

14 Establishing a Competitive Production Network in Asia.................. 171
   Otto Kumberger
   14.1 Asia – Shaping the Future of the Chemical Industry ............... 171
   14.2 BASF’s Production Philosophy ...................................... 172
   14.3 Using BASF’s Verbund Concept to Shape New Sites in Asia .... 172
   14.4 BASF’s Investments in Asia-Pacific .................................. 174
   14.5 Cultivating the Best Team in Asia-Pacific ............................. 179

15 Bayer – A Multinational Committed to China................................. 181
   Elmar Stachels
   15.1 Bayer in China .................................................................. 181
   15.2 Bayer’s Core Competencies .............................................. 182
   15.3 A Strategy for Growth .................................................... 185
   15.4 Summary and Outlook .................................................... 187

16 Bicoll – The First Sino-German Biotechnology Company ............. 189
   Kai Lamottke, Nicole Felig and Christian Haug
   16.1 Considerations for a Chinese Site .................................... 189
   16.2 Starting from Scratch in Shanghai .................................. 193
   16.3 Outlook ......................................................................... 197

17 Clba Specialty Chemicals in China – Global Direction
   and Local Expertise .............................................................. 199
   Kuno Kohler
   17.1 History ......................................................................... 199
   17.2 Industries We Serve ...................................................... 200
   17.3 Business Environment .................................................. 204
   17.4 Strategic Priorities ....................................................... 206
   17.5 Future Development ..................................................... 209

18 Degussa: Transforming the China Region ................................... 211
   Eric Baden
   18.1 Early Mover .................................................................... 211
   18.2 Why China, Why Now? ................................................... 211
   18.3 The Holding Company – Dinosaur or Dragon? ................. 214
   18.4 As Decentralized as Possible – As Centralized as Necessary .. 216
   18.5 Sourcing China – A Profitable Growth Market .................. 216
   18.6 Growth ........................................................................ 217
   18.7 The Other Side of the Medal .......................................... 219
   18.8 Conclusion ..................................................................... 220
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>A Toolbox for China – Lessons from the China Experience of Degussa Construction Chemicals</td>
<td>Boris Gorella and Christian Kober</td>
</tr>
<tr>
<td></td>
<td>19.1 Riding the Swift Juggernaut</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19.2 Five Key Issues Facing Foreign Businesses in China</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19.3 The Road Ahead</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19.4 The Take-Away</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>DSM in China: In Touch with Evolving Needs in the Specialty Chemicals Market</td>
<td>Stefan Sommer</td>
</tr>
<tr>
<td></td>
<td>20.1 Introduction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20.2 Royal DSM – From Coal to Biotechnology</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20.3 The Early Years of DSM in China</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20.4 The 1990s and the New Millennium</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20.5 DSM and China in the Asian Century</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20.6 China and DSM – Managing the Future</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20.7 Conclusion</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Vitamins – Opportunities and Challenges for Both Western and Chinese Producers</td>
<td>Manfred Eggersdorfer</td>
</tr>
<tr>
<td></td>
<td>21.1 Vitamins Are a Dynamic Market</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21.2 Vitamins Require a Complex Production Set-Up</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21.3 New Entrants Result in a Competitive Environment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21.4 New Breakthrough Technologies Impact Competitive Position</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21.5 Product Forms Are an Additional Differentiator</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21.6 Summary and Outlook</td>
<td></td>
</tr>
</tbody>
</table>

Authors: 273

Literature: 287

Index: 291
The Chemical and Pharmaceutical Industry in China: Opportunities and Threats for Foreign Companies
Festel, G.; Kreimeyer, A.; Oels, U.; von Zedtwitz, M. (Eds.)
2005, XII, 296 p., Hardcover
ISBN: 978-3-540-22544-7