Contents

Part I  Fundamental Aspects of Inorganic Nanosheets

1 Materials Chemistry of Inorganic Nanosheets—Overview and History ............................................. 3  
   Teruyuki Nakato, Jun Kawamata and Shinsuke Takagi  

2 Clay Minerals as Natural Nanosheets ........................ 33  
   Robert A. Schoonheydt and Yasushi Umemura  

3 Synthetic Nanosheets from Ion-Exchangeable Layered Solids . . . . 55  
   Teruyuki Nakato  

4 Graphene: Synthesis and Functionalization ............................ 101  
   Tomo-o Terasawa and Koichiro Saiki  

5 Chalcogenide Nanosheets: Optical Signatures of Many-Body Effects and Electronic Band Structure ........................ 133  
   Ivan Verzhbitskiy and Goki Eda  

6 Inorganic–Organic Interactions ........................................ 163  
   Tomohiko Okada and Makoto Ogawa  

7 Hybridization with Polymers ........................................ 187  
   Yoshiaki Fukushima and Kenji Tamura  

8 Colloidal Nanosheets .................................................. 201  
   Nobuyoshi Miyamoto, Yutaka Ohsedo and Teruyuki Nakato  

Part II  Functions and Applications of the Inorganic Nanosheets

9 Adsorbents Derived from Layered Solids ............................ 263  
   Tomohiko Okada and Makoto Ogawa  

10 Sensors .............................................................. 303  
   Takuya Fujimura and Ryo Sasai
11 Energy Storage Systems ........................................... 315
   Wataru Sugimoto and Dai Mochizuki

12 Graphene Oxide Based Electrochemical System for Energy Generation ........................................... 331
   Kazuto Hatakeyama, Shinya Hayami and Yasumichi Matsumoto

13 Nanosheet-Based Electronics ............................... 347
   Minoru Osada

14 Photoenergy Conversion ........................................... 357
   Yohei Ishida and Shinsuke Takagi

15 Photofunctional Nanosheet-Based Hybrids .................... 373
   Jayavant L. Gunjakar, In Young Kim and Seong-Ju Hwang

16 Efficient Photocatalytic Systems Integrated with Layered Materials Promoters ...................................... 395
   Yusuke Ide

17 Semiconductor Nanosheets ........................................... 409
   Shintaro Ida

18 Hybrids with Functional Dyes ........................................... 419
   Juraj Bujdáš

19 Optical Materials ........................................... 467
   Yasutaka Suzuki and Jun Kawamata

20 Chirality and Its Application ........................................... 483
   Hisako Sato and Akihiko Yamagishi

21 Applications of Nanoclay-Containing Polymer Nanocomposites ...................................................... 501
   Jayita Bandyopadhyay and Suprakas Sinha Ray

22 Biological Materials ........................................... 523
   Challa Vijaya Kumar
Inorganic Nanosheets and Nanosheet-Based Materials
Fundamentals and Applications of Two-Dimensional Systems
Nakato, T.; Kawamata, J.; Takagi, S. (Eds.)
2017, VIII, 542 p. 291 illus., 168 illus. in color.,
Hardcover
ISBN: 978-4-431-56494-2