

書籍紹介 Book Review

内藤牧男, 横山豊和, 細川晃平, 野城清編著
「ナノパーティクル テクノロジー ハンドブック (第3版)」
“Nanoparticle Technology Handbook (third edition)” edited by Makio Naito,
Toyokazu Yokoyama, Kouhei Hosokawa and Kiyoshi Nogi

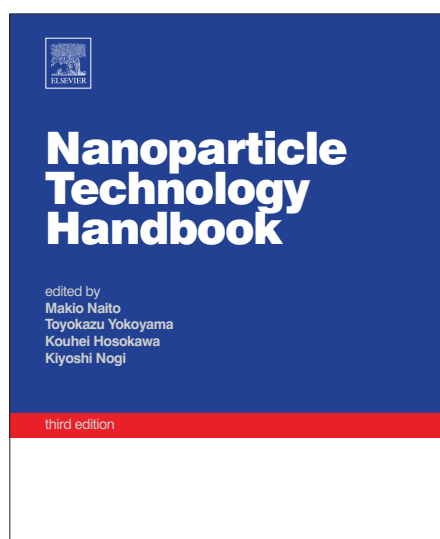
内藤 牧男
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小さな固体粒子の集合体である「粉体」は、非常にユニークな挙動を示す。たとえば、状況に応じて、粉体は気体、液体、または固体のように動作する。さらに、対応するバルクと比較して比表面積が大きいいため、粉体は非常に異なった特性を有し、このことは特に「ナノ粒子」において顕著である。粒子と粉体の特異な挙動と特性によって、これらは私たちの日常生活のいたるところにみられる幅広い産業分野で応用されている。粒子と粉体は、将来の科学技術的革新を生み出すために有望な材料を作る基礎的要素である。

A “powder”, which is an assemblage of small solid particles, exhibits very unique behavior. For example, depending on the circumstances, a powder can behave like a gas, a liquid, or a solid. Furthermore, because of the larger specific surface area relative to its bulk counterpart, powders can have very distinct properties. This is especially true for “nanoparticles”. The unique behavior and properties of particle and powder give them a wide range of industrial applications that makes them ubiquitous in our daily lives. Particles and powder are also building blocks to make promising materials for creating scientific and technical innovations in the future.

Mr. Masuo Hosokawa, the chief editor of the first edition of this Handbook, was a pioneer in this industry. When he was the President of Hosokawa Micron Corp., he founded Hosokawa Powder Technology Foundation in 1991 to contribute to the advancement of powder technology on a global scale, and published the first issue of “KONA Powder and Particle Journal” in 1983. Since then, KONA has been published annually, and distributed worldwide.

Mr. Hosokawa proposed the concept of “nanoparticle technology” long before the United States President Bill Clinton’s National Nanotechnology Initiative in 2000. One of the activities of the Foundation was to publish the Nanoparticle Technology Handbook in Japanese in 2006, which was translated into English and



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このハンドブックの初版編集者代表の細川益男氏は、この業界のパイオニアであった。当時、ホソカワミクロン株式会社の社長であった同氏は、1991年に世界規模で粉体技術の発展に貢献するためにホソカワ粉体工学振興財団を設立し、1983年に「KONA Powder and Particle Journal」の創刊号を発行した。このKONA誌はそれ以来毎年発行され、世界中に配布されている。

細川益男氏は、2000年のビル・クリントン元大統領の「国家ナノテクノロジー戦略」のはるか以前に、“nanoparticle technology”の概念を提案していた。財団の活動の一端として、2006年に「ナノパーティクルテクノロジーハンドブック」を日本語で発行し、英語に翻訳してその英語版の初版を2007年に出版した。ナノ粒子技術はその後大きく進歩したため、同氏はこのハンドブックの第2版の出版に向け尽力したが、残念ながら、2012年に第2版が発行される前の2010年3月31日に他界した。

ナノ粒子技術は2012年以後も急速に進化し、新しい分野に広く適用されるようになったため、ホソカワ粉体工学振興財団の2代目理事長であり、ホソカワミクロン株式会社の社長である細川悦男氏は、このハンドブックの第3版を発行することを決定した。この第3版では、応用編が更新され、ナノ粒子技術の最新の進歩が含まれている。19の章が追加され、応用編の79の章は、表1に示すように4つのカテゴリーに分類された。第3版は、表1に示す基礎編を含む合計877頁の書籍となっている。この新版には、ナノテクノロジーや粉体技術の140人を超える専門家が寄稿している。

ナノ粒子技術は新しく革新的な技術であり、ナノ粒子の作製、処理、応用、特性評価を対象とし、従来の微粒子/粉体技術の延長としてナノテクノロジーの中核となっている。ナノ粒子技術は、多くのエンジニアリングおよび産業分野におけるナノテクノロジーの応用において重要な役割を果たしている。

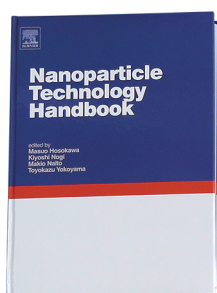
第3版が、読者に、ナノ粒子技術の基礎の理解をさらに深めながら、独自の革新的な技術と新製品を開発するための最先端の情報と知識を提供することを望むものである。

published its first edition of this Handbook in 2007. Nanoparticle technology advanced considerably after 2007, prompting Mr. Hosokawa to start preparing an updated second edition of the Handbook. He unfortunately passed away on March 31, 2010 before the second edition was published in 2012.

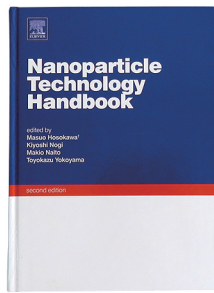
Because nanoparticle technology has rapidly evolved since 2012, and has been applied more broadly in new areas, Mr. Yoshio Hosokawa, the second President of Hosokawa Powder Technology Foundation and President of Hosokawa Micron Corporation decided to publish a third edition of the Handbook. In this third edition, the applications section of the Handbook has been updated to include the most recent advances in nanoparticle technology. Nineteen chapters have been added. The 79 chapters in the applications section are organized into four categories as shown in Table 1. The third edition has totally 877 pages including fundamental part as shown in Table 1. Over 140 experts in nanotechnology and/or powder technology contributed to this new edition.

Nanoparticle technology is a new and revolutionary technology. It handles the preparation, processing, application and characterization of nanoparticles and has become the core of nanotechnology as an extension of conventional fine particle/powder technology. Nanoparticle technology plays an important role in the implementation of nanotechnology in many engineering and industrial fields.

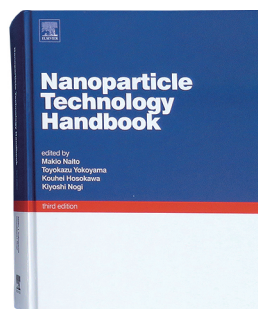
I hope the third edition will give readers state-of-the-art information and knowledge to develop their own innovative technologies and new products, further enhancing our understanding of the fundamentals of nanoparticle technology.



1st edition (2007)



2nd edition (2012)



3rd edition (2018)

表 1 Contents

FUNDAMENTALS

1. Basic Properties and Measuring Methods of Nanoparticles

1.1. Size Effect and Properties of Nanoparticles	3
1.2. Particle Size	9
1.3. Particle Shape	10
1.4. Particle Density	13
1.5. Melting Point, Surface Tension and Wettability	17
1.6. Specific Surface Area and Pore	19
1.7. Composite Structure	22
1.8. Crystal Structure	27
1.9. Surface Characteristics	31
1.10. Mechanical Property	34
1.11. Electrical Properties	37
1.12. Magnetic Properties	40
1.13. Optical Property of Nanoparticle	44

2. Structural Control of Nanoparticles

2.1. Structure Construction and Function Adaptation of Nanoparticles	49
2.2. Particle Size	55
2.3. Particle Shape	69
2.4. Composite Structure	76
2.5. Pore Structure	91
2.6. Nanoparticle Design for Drug Delivery System	100
2.7. Nanotubes (Carbon Nanotube)	105

3. Characteristics and Behavior of Nanoparticles and Its Dispersion Systems

3.1. Introduction of Nanoparticle Dispersion and Aggregation Behavior	109
3.2. Single Nanoparticle Motion in Fluid	114
3.3. Brownian Diffusion	120
3.4. Adsorption Properties and Wettability of Nanoparticle Surface	121
3.5. Interactions Between Particles	123
3.6. Aggregation and Dispersion, Characterization and Control	149
3.7. Rheology of Slurry	158
3.8. Simulation of Colloidal Dispersion System	162

4. Control of Nanostructure of Materials

4.1. Assembly of Nanoparticles and Functionalization	169
4.2. Nanoparticles-Arranged Structures	170
4.3. Nanopore Structure	181
4.4. Nanocomposite Structure	193
4.5. Structure Control of Nanoparticle Collectives by Sintering and Bonding	212
4.6. Self-Assembly	239

5. Characterization Methods for Nanostructure of Materials

5.1. Nanostructure and Function (Characterization of Local Nanostructure)	255
5.2. Crystal Structure	256
5.3. Surface Structure	265
5.4. Nanopore Characterization	282
5.5. Grain Boundaries and Interfaces	288
5.6. Evaluation Methods for Oxide Heterostructures	297

6. Evaluation Methods for Properties of Nanostructured Body

6.1. Functionality of Nanostructures and Their Characteristic Evaluation	301
6.2. Mechanical Properties	306
6.3. Thermophysical Properties	318
6.4. Electric Properties	325
6.5. Electrochemical Properties	338
6.6. Magnetic Properties	349
6.7. Optical Properties	352
6.8. Catalytic Property	357
6.9. Properties of Gas Permeation and Separation Membranes	360

7. Environmental and Safety Issues with Nanoparticles

7.1. Introduction	365
7.2. Nanoparticles and Environment	365
7.3. Safety of Nanoparticles	379
7.4. Removal of Nanoparticles	388

APPLICATIONS

Category A- Medical, Cosmetic, Biological

Application 1 - Development of New Cosmetics Based on Nanoparticles	399
Application 2 - Design of Nanoparticles for Oral Delivery of Peptide Drugs	407
Application 3 - Development of Photocatalyst Inserted Into Surface of Porous Aluminosilicate	415

Application 4 - Nanoparticle Formation of DNA (Globule Transformation)	419
Application 5 - Addressing of Nanoparticles by Using DNA Molecules	423
Application 6 - Development of the Thermoresponsive Magnetic Nanoparticle and Its Deployment in the Biotechnology Field	427
Application 7 - Pinpoint Drug and Gene Delivery	435
Application 8 - A Cancer Treatment Strategy That Combines the Use of Inorganic/Biocomplex Nanoparticles With Conventional Radiation Therapy	439
Application 9 - Development of Functional Skin Care Cosmetics Using Biodegradable PLGA Nanospheres	445
Application 10 - PLGA Nanoparticle Design and Preparation for DDS and Medical Device	451
Application 11 - PLGA Nanosphere Technology for Novel Nanomedicine and Functional Cosmetics	461
Application 12 - Delivery to the Brain	469
Application 13 - Bioimaging With Quantum Dots	473
Application 14 - Application of Quantum Dots for Biomedical Engineering	479
Application 15 - Application of Polymeric Nanoparticles and Polymeric Micelles for Treatment of Biofilm Infection Disease	481
Category B- Energy, Batteries, Environmental	
Application 16 - Development of High-Performance Electrochemical Reactors	487
Application 17 - Superior Thermal Insulation Film With Transparency Achieved by Hollow Silica Nanoparticles	493
Application 18 - Development of Fuel Cells	499
Application 19 - Mechanical Synthesis of Composite Oxide and Its Application for SOFC Cathode	505
Application 20 - A Dye-Sensitized Solar Cell Utilizing Metal Nanoparticle	511
Application 21 - Room Temperature Fabrication of Electrode-Solid Electrolyte Composite for All-Solid-State Rechargeable Lithium Batteries	517
Application 22 - Enhancement of the Performance of Insulating Materials	525
Application 23 - Collection Technology for Nanoparticles in Flue Gas	529
Application 24 - Powder Technology and Nanotechnology Contributed for Clean Utilization of Coal	533
Application 25 - Zeolite Membrane	539
Application 26 - Development of Nanoparticle Composite Technique for Low Pt-Loading PEFCs	543
Application 27 - Novel Recycling of Fiber-Reinforced Plastics by Using Nanoparticle Bonding	547
Application 28 - Improvement of Lithium-Ion Battery Performances by Controlling Nanocomposite Structure	551
Application 29 - Dendrimers and Their Application to Organic Electronics Devices	559
Application 30 - Ceramic Filter for Trapping Diesel Particles	563
Application 31 - Development of Exhaust Catalyst	569
Application 32 - Electrical Conductive CNT-Dispersed Si ₃ N ₄ Ceramics	575
Application 33 - Preparation of Solid Electrolyte Particles and Solid-Solid Interfaces for All-Solid-State Batteries	579
Application 34 - Development and Multi-Functionalization of High-Functional Separation Membranes	585
Application 35 - Development of a High-Performance Secondary Battery by Controlling the Surface Structure	591
Category C: Electronic and Magnetic Materials, Memories, Light Emitting Materials, Displays	
Application 36 - Development of Bright Phosphors Using Glasses Incorporating Semiconductor Nanoparticles	597
Application 37 - Closely Packed Colloidal Crystal Assembled With Nanoparticles and Its Application for Smart Materials With Tunable Structural Color	601
Application 38 - Practical Issue of Nanosized Colorant Particles	607
Application 39 - Expression of Optical Function by Nanostructure Using Femtosecond Laser Processing	613
Application 40 - Ceramic Fillers for High Frequency Dielectric Composites	619
Application 41 - Material Design of Electronic Liquid Powder Used in Novel-Type Bistable Reflective Display (QR-LPD)	625
Application 42 - Sensing Based on Localized Surface Plasmon Resonance in Metallic Nanoparticles	631

Application 43 - Development of Photonic Crystal Resonators for Terahertz Wave Sensing by Using Nanoparticle Stereolithography	635
Application 44 - AC Overhead Transmission Line Audible-Noise Reduction Measures Using Surface Improvement	637
Application 45 - Development of Photonic Crystals Based on Nanoparticle Assembly	643
Application 46 - Microelectronics Packaging by Metal Nanoparticle Pastes	647
Application 47 - Development of Novel Ferroelectric Materials	651
Application 48 - Development of Magnetorheological Fluid by Using Iron Nanoparticles and the Application to Haptics Devices	655
Application 49 - High Performance Wiring Based on Nanowelding Technology for Printed Electronics	661
Application 50 - Development of New Phosphors	667
Application 51 - Development of Optical Memory Using Semiconductor Nanoparticles	671
Category D- Synthesis, Dispersion, Processing	
Application 52 - Nanoparticle Synthesis, Dispersion, and Functionalization for Industrial Application	675
Application 53 - Supercritical Hydrothermal Synthesis of Nanoparticles	683
Application 54 - Nozzle-Free Inkjet Technology	691
Application 55 - Dispersion of Fine Silica Particles Using Alkoxysilane and Industrialization	695
Application 56 - Barium Titanate Nanoparticles Synthesized Under Sub- and Supercritical Water Conditions	701
Application 57 - Surface Modification of Nanoparticles by Silane Alkoxides and Their Application in Silicone-Based Polymer Nanocomposites	705
Application 58 - Formation of Thick Electronic Ceramic Films With Bonding Technique of Crystalline Fine Particles and Their Applications	711
Application 59 - Development of New Materials by the Mild Dispersion of Nanoparticles in Slurries by Bead Milling	715
Application 60 - Three-Dimensional Structural Analysis of Nanocomposite Materials Containing Nanoparticulates	721
Application 61 - Dispersion Control of Al ₂ O ₃ Nanoparticles in Ethanol	727
Application 62 - Liquid-Crystalline Inorganic Nano- and Fine Particles	731
Application 63 - Fabrication Technique of Organic Nanocrystals and Their Optical Properties and Materialization	739
Application 64 - Instantaneous Nanofoaming Method for Fabrication of Closed-Porosity Silica Particle	745
Application 65 - Creation of Boron Nitride Nanotubes and Possibility for a Series of Advanced Nanocomposite Materials	751
Application 66 - Fabrication of Functional Ceramic Devices Produced by Three-Dimensional Molding Using Microstereolithography	759
Application 67 - Morphology Control of Particles and Their Patterning	765
Application 68 - Development of Ceramic-Bonded Carbon	777
Application 69 - Nano/Microcomposite Particles: Preparation Processes and Applications	781
Application 70 - Generation of Metal Nanoparticles Using Reactive Plasma Arc Evaporation	787
Application 71 - Synthesis of Nanoparticles by Radio Frequency Induction Thermal Plasma	791
Application 72 - Self-Assembly of Oxide Nanosheets: Precise Structural Control and Its Applications	797
Application 73 - Fabrication of Ceramics With Highly Controlled Microstructures by Advanced Powder Processing	801
Application 74 - Surface Modification of Inorganic Nanoparticles by Organic Functional Groups	809
Application 75 - Evaluation and Applications of Dispersing Carbon Nanotube in the Polymers	813
Application 76 - Development of Polymer-Clay Nanocomposites by Dispersion of Particles Into Polymer Materials	819
Application 77 - Development of Dispersion and Composing Processes of Nanoparticles and Their Application to Advanced Firefighter Uniform	823
Application 78 - Preparation of Metal Nanoparticles and Their Application for Materials	829
Application 79 - Nanotechnology Challenge in Mechanochemistry	839
Index	845

〈著者略歴 Author's Short Biography〉

内藤 牧男 Makio NAITO



大阪大学接合科学研究所教授。工学博士（1987年，名古屋大学）。2015～2019年に粉体工学会会長，現在監事。専門分野は粉体，微粒子の構造制御と機能化。300報以上の学術論文，120報以上の解説等を発表。80冊以上の著書の分担等の執筆があり，27冊の本を監修，60以上の特許を保持している。Richard M.Fulrath賞（アメリカセラミックス学会，2002年），KONA賞（2019年）などの国際賞を受賞。2010年よりアメリカセラミックス学会フェロー，2020年より同学会理事。2012年よりWorld Academy of Ceramicsのアカデミー会員，現在同アドバイザーボードメンバー。上海交通大学，上海珪酸塩研究所などの客員教授を歴任。

Makio Naito is a professor at the Joining and Welding Research Institute (JWRI), Osaka University in Japan. He received his Ph. D. degree in chemical engineering from Nagoya University in 1987. He served as the President of The Society of Powder Technology, Japan from 2015 to 2019. His publications cover a wide range of studies in the fields of advanced materials and novel powder processing and characterization. He has authored or coauthored more than 300 refereed journal papers and 120 review articles. He has contributed 80 books, edited 27 books and holds more than 60 patents. He has received several prestigious awards including the Richard M. Fulrath Award from the American Ceramic Society (ACerS) in 2002 and the KONA Award in 2019. He has been a Fellow of the ACerS since 2010, and serves on the ACerS Board of Directors from 2020. He has been a Professional Academy Member of the World Academy of Ceramics since 2012, and has served on the Academy's Advisory Board since 2018. He has been serving also as visiting professor at Shanghai Jiao Tong University, Shanghai Institute of Ceramics, Chinese Academy of Sciences, etc.