pioneer life of Moore's ancestors, and the birth of Gordon Moore at the start of the Great Depression (chapter 1). The text breezes through Moore's boyhood and early interest in chemicals and explosives (chapter 2), the very practical courtship of Gordon Moore and Betty Whitaker, and the young couple's life while Moore pursued chemistry at the University of California–Berkeley and the California Institute of Technology (chapter 3). Later chapters cover Moore's recruitment by William Shockley and the subsequent departure of Moore, Robert Noyce, and six others—the Traitorous Eight—to form Fairchild Semiconductor (chapter 4); the development of the planar transistor at Fairchild (chapter 5); the publication of Moore's prediction for silicon transistors (chapter 6); the departure of Moore and Noyce from Fairchild to co-found Intel (chapter 7); revolutionary engineering at Intel that led to widespread adoption of microprocessors, the commitment to innovation that increased complexity while driving down cost, brutal competition from Japanese manufacturers, and the emergence of the Microsoft Windows and Intel (Wintel) monopoly (chapters 8–10). The book ends with a discussion of Moore's gradual transition to retirement and his emergence as one of the greatest philanthropists in American history (chapter 11), and an assessment of his legacy (coda).

The authors do a masterful job of treating the chemistry, materials science, and engineering of device fabrication at just the right level of detail to make the story captivating. They elegantly explain the complex processes involved in crystal growth, wafering, dopant diffusion, etching, metallization, packaging, and testing using language that makes semiconductor technology accessible to the general public. It is clear that Moore's inspiration and guidance were vital to the perfection of silicon planar transistor technology, development of the silicon-gate metal oxide semiconductor memory chip (Intel 1101), and the dawn of the modern computing era starting with the iconic Intel 4004 microprocessor in 1971. Technology, history, economics, and human conflicts come together seamlessly. Historical events, such as the launch of Sputnik, the campus unrest of the 1960s and 1970s, the oil embargo, and the rise of Apple and Microsoft, take place in the background as the saga of Gordon Moore unfolds.

The authors begin the discussion of Moore's legacy by pointing to his success as a family man. Much of the credit for his stable and committed family life should go to Betty Moore, who has toiled in the shadows over six decades, shielded the conflict-averse Moore from domestic confrontations, and exerted considerable influence on his philanthropy. The portrait of Gordon and Betty Moore's humility, frugality, and decency painted by the authors is just as absorbing as the discussion of Moore's technological wizardry. Moore comes through as an unassuming genius, like Paul Allen and Steve Wozniak, who partnered with a flamboyant leader to co-found a major American technology company and influence the lives of people all across the globe.

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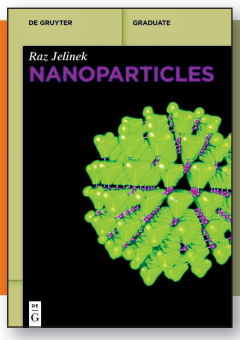

Nanoparticles
Raz Jelinek
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This book is an excellent starting point for undergraduate students who are interested in nanoparticle science and technologies. It covers the fundamentals and applications of nanoparticles and not nanoscale materials in a broader perspective. The remarkable progress of nanoparticle technology in physics, chemistry, materials science, and medicine, and its ability to expand their boundaries are discussed. This book will encourage further exploration of this exciting field.

The first chapter gives a short introduction about the history of nanoparticle technology with the help of band diagrams. The second chapter talks about the evolution of nanoparticle technology in semiconducting materials and its application in solar energy, biological imaging, etc. Pictorial representations of band models help the reader to visualize different types of materials such as metals, semiconductors, and insulators. Synthesis and applications of quantum dots in solar panels, photonic applications, and biological applications are discussed with beautiful images and experimental setups. Physical properties and applications of metal nanoparticles are discussed in the third chapter. Properties and applications of gold and silver nanoparticles in different fields such as molecular sensors, electrochemical sensors, catalytic applications, and biomedical applications are discussed extensively. Scanning electron microscopy (SEM) images showing the evolution of silver/gold nanomaterials into different morphologies are attractive. Synthesis and the physical properties of metal alloy nanomaterials are discussed in the second part of the third chapter. The fourth chapter talks about metal oxide nanoparticles such as Fe_3O_4, silicon oxide, titanium oxide, zinc oxide, and rare-earth oxide nanoparticles. Synthesis of magnetic oxide nanoparticles and their application in antitumor therapy is beautifully explained with appropriate SEM morphology images and cartoons. Rare-earth oxides such as CeO and Gd_2O_3 preparation and applications are discussed in

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the second part of the chapter. Naturally occurring biological nanomaterials and man-made synthetic nanoparticles and their applications in the organic and biological fields are discussed in the fifth chapter. Molecular formulas and electron microscope images of biological entities such as amino acids, amyloid nanofibers, and peptide nanotubes help the reader to understand the concepts easily. The sixth chapter talks about two or more atomic entities belonging to two different families (hybrid and composite nanoparticles). Integrating metal-semiconducting nanoparticles (e.g., CdS-FePt and Au/PbS), their morphological/structural changes, and their applications are discussed. Metal oxide hybridization is discussed in the second part of the chapter. Applications of nanoparticles in biology and biomedicine are discussed briefly in the seventh chapter. Nanoparticle transport across cell barriers and the effects of nanoparticles on cell entities are depicted with beautiful cartoons. The effect of electrostatic interaction between DNA and nanoparticles is explained with the help of clear images. Unique properties of nanoparticle assemblies and their applications are discussed in the eighth chapter. Gold nanoparticle assembly is discussed extensively with appropriate schematics and electron microscopy images. Semiconducting nanoparticle assemblies and multicomponent nanoparticle assemblies are briefly discussed at the end. Up-to-date references are given for each chapter as further reading.

In summary, this book gives a good introduction to very basic ideas about experimental and conceptual approaches applied to the field of nanoparticles. Even though detailed models, theoretical backgrounds, and example problems are not given in any of the chapters, the text gives a very good glimpse of nanoparticles.

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