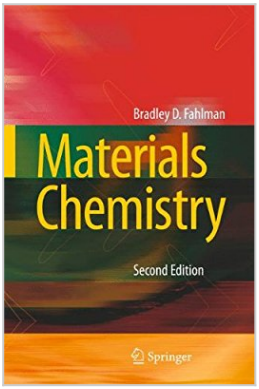

Materials Chemistry

By Bradley D. Fahlman

Materials Chemistry By Bradley D. Fahlman

The 2nd edition of Materials Chemistry builds on the strengths that were recognized by a 2008 Textbook Excellence Award from the Text and Academic Authors Association (TAA). Materials Chemistry addresses inorganic-, organic-, and nano-based materials from a structure vs. property treatment, providing a suitable breadth and depth coverage of the rapidly evolving materials field ? in a concise format. The 2nd edition continues to offer innovative coverage and practical perspective throughout, e.g.: the opening solid-state chemistry chapter uses color illustrations of crystalline unit cells and digital photos of models to clarify their structures. This edition features more archetypical unit cells and includes fundamental principles of X-ray crystallography and band theory. In addition, an ample amorphous-solids section has been expanded to include more details regarding zeolite syntheses, as well as ceramics classifications and their biomaterial applications. The subsequent metals chapter has been re-organized for clarity, and continues to treat the full spectrum of powder metallurgical methods, complex phase behaviors of the Fe-C system and steels, and topics such as corrosion and shape-memory properties. The mining/processing of metals has also been expanded to include photographs of various processes occurring in an actual steelmaking plant. The semiconductor chapter addresses evolution and limitations/solutions of modern transistors, as well as IC fabrication and photovoltaics. Building on the fundamentals presented earlier, more details regarding the band structure of semiconductors is now included, as well as discussions of GaAs vs. Si for microelectronics applications, and surface reconstruction nomenclature. The emerging field of ‘soft lithographic’ patterning is now included in this chapter, and thin film deposition methodologies are also greatly expanded to now include more fundamental aspects of chemical vapor deposition (CVD) and atomic layer deposition (ALD). The polymer and ‘soft’ materials chapter represents the largest expansion for the 2nd edition. This chapter describes all polymeric classes including dendritic polymers, as well as important additives such as plasticizers and flame-retardants, and emerging applications such as molecular magnets and self-repairing polymers. This edition now features ‘click chemistry’ polymerization, silicones, conductive polymers and biomaterials applications such as biodegradable polymers, biomedical devices, drug delivery, and contact lenses. Final chapters on nanomaterials and materials-characterization techniques are also carefully surveyed, focusing on nomenclature, synthetic techniques, and applications taken from the latest scientific literature. The 2nd edition has been significantly updated to now

include nanotoxicity, vapor-phase growth of 0-D nanostructures, and more details regarding synthetic techniques and mechanisms for solution-phase growth of various nanomaterials. Graphene, recognized by the 2010 Nobel Prize in Physics, is now also included in this edition. Most appropriate for Junior/Senior undergraduate students, as well as first-year graduate students in chemistry, physics, or engineering fields, Materials Chemistry may also serve as a valuable reference to industrial researchers. Each chapter concludes with a section that describes important materials applications, and an updated list of thought-provoking questions. The appendices have also been updated with additional laboratory modules for materials synthesis (e.g., porous silicon) and a comprehensive timeline of major materials developments.

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Editorial Review

Review

Book Review Exerpts of 1st edition:
'Excellent, up-to-date discussion of many classes of materials. Concisely written, understandable with integration of real-world and historical references. Well-illustrated with judicious use of color. Extensive research sections for further study.'
As a biochemist/chemical educator, I found the text very instructive. A material science engineer at Intel (a friend) gave the book a 'thumbs-up' review."

Bradley Fahlman is to be commended for undertaking the challenge of producing what is probably the first true chemistry text in Materials Chemistry. This is a rapidly growing field, along with its spin-off Nanoscience. For producing the first true Chemistry text in a new field, Materials Chemistry, and for its high quality, it is most appropriate that Bradley D. Fahlman be honered with a 2008 Texty Award for Excellence.
TEXTY Awards Judges' comments.

'After briefly defining materials chemistry and its history, six chapters discuss sold-state chemistry, metals, semiconducting materials, organic 'soft' materials, nanomaterials, and materials characterization. The author chose depth over breadth, resulting in deep, detailed prose. The strengths of this book are its illustrations and color graphics, as well as up-to-date references and examples.'
D.E. Hubbard, Missouri University of Science and Technology, CHOICE/Choice Reviews Online, February 2008

Review
The 1st edition of this book *Materials Chemistry* has won the **Textbook Excellence Award** from the Text and Academic Authors Association (TAA) in 2008.

From the Back Cover
The 2nd edition of Materials Chemistry builds on the strengths that were recognized by a 2008 Textbook Excellence Award from the Text and Academic Authors Association (TAA). Materials Chemistry addresses inorganic-, organic-, and nano-based materials from a structure vs. property treatment, providing a suitable breadth and depth coverage of the rapidly evolving materials field. The 2nd edition continues to offer innovative coverage and practical perspective throughout. After briefly defining materials chemistry and its history, seven chapters discuss solid-state chemistry, metals, semiconducting materials, organic "soft" materials, nanomaterials, and materials characterization. All chapters have been thoroughly updated and expanded with, for example, new sections on ‘soft lithographic’ patterning, ‘click chemistry’ polymerization, nanotoxicity, graphene, as well as many biomaterials applications. The polymer and ‘soft’ materials chapter represents the largest expansion for the 2nd edition. Each chapter concludes with a section that describes important materials applications, and an updated list of thought-provoking questions. The appendices have also been updated with additional laboratory modules for materials synthesis and a comprehensive timeline of major materials developments. Appropriate for junior/senior undergraduate students, as well as first-year graduate students in chemistry, physics, or engineering. Materials Chemistry may also serve as a reference to industrial researchers.

Users Review

From reader reviews:

Nathan Kelly:

Book is to be different per grade. Book for children right up until adult are different content. As we know that book is very important usually. The book Materials Chemistry had been making you to know about other knowledge and of course you can take more information. It is quite advantages for you. The reserve Materials Chemistry is not only giving you a lot more new information but also to become your friend when you feel bored. You can spend your own personal spend time to read your book. Try to make relationship using the book Materials Chemistry. You never sense lose out for everything if you read some books.

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Yolanda Sartain:

Precisely why? Because this Materials Chemistry is an unordinary book that the inside of the book waiting for you to snap the item but latter it will distress you with the secret the idea inside. Reading this book beside it was fantastic author who write the book in such awesome way makes the content inside of easier to understand, entertaining technique but still convey the meaning fully. So , it is good for you because of not hesitating having this any longer or you going to regret it. This book will give you a lot of rewards than the other book include such as help improving your expertise and your critical thinking means. So , still want to postpone having that book? If I had been you I will go to the reserve store hurriedly.

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