

Stuff Matters: Exploring the Marvelous Materials That Shape Our Man-Made World
Mark Miodownik

Houghton Mifflin Harcourt, 2014
272 pages, \$15.95
ISBN 978-0544236042

I was a bit intimidated when I first realized the book that I was reviewing had also been reviewed by the *Wall Street Journal*, *New York Times*, and the *Guardian*, among others. As a PhD materials scientist, I already think that materials “matter.” What could I learn from a book on the science behind common materials that is geared toward the general public?

But I dived in and ... loved it. It is a great book. Miodownik is the head of the Materials Science Department of University College London. He loves materials and wants you to love them, too. He weaves together a delightful story of materials, told around events in his life and his fascination with common items—from chocolate to his mum’s tea-cups—with sheer imagination. The centerpiece of the book is a picture of him writing on his rooftop apartment, and he tells you about all the materials within

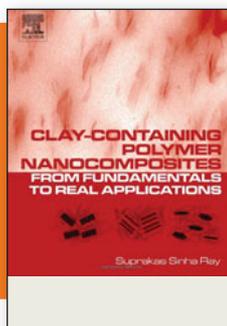
his touch (paper, graphite) and within his gaze (steel, a concrete and glass tower). The pondering of the objects in the picture are expanded with anecdotes—he was stabbed as a teenager with a razor blade, and then became so fascinated with steel that he went on to study metallurgy at Oxford. He crashed through his car window and so tells about standard glass and safety glass. He tore a ligament and so gives a tour of bioengineered materials.

Miodownik is almost desperate to get you to stop, look, and think about the materials around you. He makes this materials lesson easy with his fluid writing style and enthusiasm. You cannot help but be charmed by the materials as he describes them, as one might tell the life story of an old friend. SiO₂ aerogel is anthropomorphized as the author “worries that it wasn’t being treated right,” and he ponders why people generally have no affection for glass. Steel is “indomitable,” and paper is “trustful.”

The book is also playful, with the style of the book changing from chapter to chapter. For plastics, he writes a play about the discovery of plastic by John Wesley Hyatt involving a western pool hall, dentistry, and George Eastman strolling into Hyatt’s office to start the age of modern photography and film through the use of celluloid. With all of this outpouring of love, history, and science of materials woven into stories of common items and events, the book is an easy read.

I recommend this book to all materials scientists and engineers, because it’s a love story about materials, and you cannot help but feel great about your chosen profession as you read the book. I also learned quite a bit, even in parts that were quite obvious to me (metals are, in fact, made of crystals). The book is educational because of the history and beautifully simple language used to explain complex topics (e.g., diamond versus graphite versus graphene). It would also be a good book for a materials scientist to give to friends and relatives who are puzzled by their love of materials science—it might help to explain why your job is so cool.

Reviewer: Karen Swider Lyons
researches fuel cell and battery materials and their integration into naval systems in Alexandria, Va., USA.



Clay-Containing Polymer Nanocomposites: From Fundamentals to Real Applications
Suprakas Sinha Ray

Elsevier, 2013
416 pages
ISBN 978-0-444-59437-2

Clay-containing polymers are a new class of composite material that are gaining more importance in technological applications. These composites belong to the class of two-dimensional nanocomposites. The worldwide market for these materials today is estimated to be in the range of one billion US dollars;

within the next five years this figure is expected to at least double.

The book, divided into 13 chapters, discusses every aspect important in understanding the structure and applications of these materials. Most chapters start with the theoretical background, but the book is written in a way that makes

skipping these sections possible. This is of great importance for the wider readership. This is a book about polymers; therefore, a broad knowledge of polymer chemistry is an advantage but not necessary to understand the details of the properties of this type of nanocomposite. The topics treated in this book range from classification of different types of clays and polymers and the preparation of the composite, to properties and characterization. Looking at properties, the discussion starts with mechanical properties, leads to barrier properties and mechanical stability, then to the most important fire-retardant properties. Fire retardancy is the primary reason for the huge technical and economic