



**Textbook:** [Materials Characterization Techniques](#), written by Sam Zhang, Lin Li and Ashok Kumar, published by CRC Press, 344pp Pub. date: 12/22/2008 ISBN 9781420042948; 1420042947

**From:** Shatkin, Allison [mailto:Allison.Shatkin@taylorandfrancis.com]  
**Sent:** Wednesday, November 16, 2011 1:48 AM  
**To:** Sam Zhang Shanyong (Prof)  
**Subject:** RE: feedback on my book?

...

"I've had a chance to look over the Zhang book and it seems like a good fit for my Materials Characterization course...good coverage of electron microscopy."

--Adopter from Cal Poly State University, USA

"...this book covers most instruments that I plan to cover for the course."

--Adopter from Louisiana State University, USA

"The book describes a wide variety of experimental techniques and is a suitable textbook for a general material characterization course at graduate level."

--Adopter from University of New Orleans, USA

"Basic reason for changing text (from Brandon and Kaplan) was the wider range of topics covered. B&K has much more detail of diffraction and electron microscopy but is limited on surface techniques. We wanted to have a resource the students could refer to on topics we don't cover as completely in the lab. We do microscopy and diffraction well in lab."

--Adopter from Purdue University, USA

"The book gives a good introduction into several techniques used for materials characterization, e.g., surface science."

--Adopter from Syddansk Univ, Denmark

**From:** Shatkin, Allison [mailto:Allison.Shatkin@taylorandfrancis.com]  
**Sent:** Thursday, November 17, 2011 4:29 AM  
**Subject:** Materials Characterization Techniques: new adoption & feedback

Hi Sam, Ashok, and Lin,

Just received word of a new adoption of your book for the next spring. Congratulations! The adopting professor's feedback is below in form of book strengths and weaknesses, which should be looked at when considering how to update for a new edition.

**Adopting University:** University of Missouri - Department of Chemical & Biological Engineering

**Course:** Materials Characterization

**Start Date:** 1/17/2012

**Enrollment:** 20

**Book Strengths:** This is a great text for graduate students interested in the basics of materials characterization who either do not want or do not need repetitions of the theory behind material properties, or of detailed theory underlying each characterization method. This book chooses an excellent selection of characterization methods that aren't typically grouped together in other books, and presents them in an organized fashion. In particular, this books gives the strengths and limitations of each technique, and demonstrates the applications of each method - in some cases illustrating novel uses. The additional references at the end of each chapter provide more information, and are usually seminal references.

**Book Weaknesses:** The book is not intended to focus on the theory behind material properties, so if that is what you are looking for, this book won't cover that. Additionally, the book contains no homework problems or projects, which would help it be more useful to undergraduate students. However, as it stands, it's a solid text for graduate students.

Best,  
Allison

Allison Shatkin  
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**From:** Dale, Andrea [<mailto:Andrea.Dale@taylorandfrancis.com>]  
**Sent:** Tuesday, February 28, 2012 4:54 AM  
**To:** Sam Zhang Shanyong (Prof); Li Lin; [kumar@usf.edu](mailto:kumar@usf.edu)  
**Subject:** Book Review - Materials Characterization Techniques (42947)

Dear Drs. Zhang, Li, and Kumar,

Please find the attached book review for your book entitled "Materials Characterization Techniques."  
This document is for your files.

Thank you so much!

Best wishes,

**Andrea Dale**

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Experts must be able to analyse and distinguish all materials or combinations of materials, in use today – whether they are metals, ceramics, polymers, semiconductors, or composites. To understand a material's microstructure, how microstructure determines its properties, and how that material will subsequently work in technological applications, researchers apply basic principles of chemistry, physics, and biology to address its scientific fundamentals, as well as how it is processed and engineered for use. Emphasising practical applications and real-world case studies, materials characterisation techniques presents the principles of widely used, advanced surface and structural characterisation techniques for quality assurance, contamination control, and process improvement.

The volume contains the following items:

- explores scientific processes to characterize materials using modern technologies
- provides analysis of materials' performance under specific use conditions
- focuses on the interrelationships and interdependence between processing, microstructure, properties, and performance
- details the sophisticated instruments involved in an interdisciplinary approach to understanding the wide range of mutually interacting processes, mechanisms, and materials
- covers electron, X-ray-photoelectron, and UV spectroscopy; scanning-electron, atomic-force, transmission-electron, and laser-confocal-scanning-florescent microscopy, and gel electrophoresis chromatography
- presents the fundamentals of vacuum, as well as X-ray diffraction principles.

Explaining appropriate uses and related technical requirements for characterisation techniques, the authors omit lengthy and often intimidating derivations and formulations. Instead, they emphasise useful basic principles and applications of modern technologies used to characterise engineering materials, helping readers grasp micro- and nano-scale properties. This text will serve as a valuable guide for scientists and engineers involved in materials characterisation and also as a powerful introduction to the field for advanced undergraduate and graduate students.

## Reviewed by Janez Grum

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