
BOOK REVIEW

Fiber-Reinforced Ceramic Composites: Materials, Processing and Technology

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REFERENCE: *Fiber-Reinforced Ceramic Composites: Materials, Processing and Technology*, K. S. Mazdayasni, Ed., Noyes Publications, Park Ridge, NJ, 1990, ISBN: 0-8155-1233-3, \$78.00.

As noted in the editor's preface, this book provides, for the first time, a comprehensive treatment of continuous and discontinuous fiber and whisker reinforced ceramic composites. This book was written by a group of active researchers in the field. Therefore, the history, the current state of art, and the future prospects of ceramic composites are described by several first-hand experiences, results, and deep analyses. For a topic as complex as ceramic composites, it is impossible to cover every aspect in detail in one single book. However, this book does an admirable job and also includes useful information sources and an extensive reference list with each chapter. Thus, it is a useful reference source for all researchers in the field. Although extensive research results are presented, this book is not merely a collection of papers. The contents and topics in the book are organized in a pedagogical sequence which makes it useful as a textbook for advanced graduate courses. The important results are shown or summarized with many clear illustrations and tables.

Consistent with the title of the book, the authors have attempted to provide the readers an up-to-date overview of the development in the ceramic composite research in three categories: materials, processing, and technology. Three chapters are dedicated to the general mechanical properties of ceramic matrix

composites. Test methods used for evaluating the mechanical properties of composites are described and critically evaluated. The mechanical behavior of such composites is modeled based on both macro- and micro-mechanical points of view with an emphasis on the damage mode and the effect of the interface between the fiber and matrix.

Four chapters are dedicated to the discussion of the reinforcing materials: ceramic fibers and whiskers. The syntheses of the most widely used ceramic fibers and SiC whiskers are described. The properties of nonoxide and oxide fibers and SiC whiskers are critically examined for different applications. Available techniques for characterizing fiber and whisker properties, including chemical, physical, microstructural, and mechanical properties, are also discussed. The different composite and ceramic matrix materials are discussed in four additional chapters. The fabrication techniques and properties of these material systems are described. The three most important processing and manufacturing technologies for ceramic composites, vapor deposition, melt infiltration, and chemical vapor infiltration, are discussed in one chapter each. Composite fabrication using these technologies is described and the resulting properties are examined. Finally, one chapter is dedicated to the future areas of research and opportunities for ceramic composites. This chapter is well written and quite useful for someone trying to get into this area.

Since each chapter in this book was written by different authors, it is understandable that there is some duplication in coverage although an effort has been made to avoid it. However, this also provides the readers with different viewpoints on the same problem and also a sense of the issues on which there is widespread agreement. In summary, this is an informative book and highly recommended for those who are working in the field of ceramic composites and is also an excellent reference book for an advanced course in composites.