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Processing Science of Advanced Ceramics

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Processing Science of Advanced Ceramics

Preface

Advanced ceramics and ceramic matrix composites play an increasingly important role in complex systems for structural, electronic, magnetic, and optical applications. This trend is expected to continue along with a specific goal to tailor composites that display spatial resolution in the micrometer and nanometer range. The fabrication techniques being used range from consolidation of submicron-sized powders to vapor phase deposition.

The papers included in this proceedings volume were presented at a symposium on "Processing Science of Advanced Ceramics" held at the Materials Research Society's Spring Meeting in San Diego, California, April 27-28, 1989. The objective of this symposium was to review the progress made in the field and to identify the remaining critical issues to be solved through innovative processing approaches to improve the properties and reliability of advanced ceramics. In addition, this symposium was intended to complement the series of MRS symposia on "Better Ceramics Through Chemistry" from a physics and engineering point of view.

Invited speakers from the United States, Japan, and Europe were asked to lead key areas with review presentations on:

- powder synthesis and colloidal processing
- sol-gel processing and ceramic/polymer composites
- sol-gel processing of thin films and electronic ceramics
- plasma-assisted processing and novel composites
- fiber and whisker-reinforced composites

Critical issues in two fundamental fabrication technologies were addressed: (1) fabrication through the consolidation of submicron-sized powders, and (2) fabrication through gas/solid processes. Both fabrication technologies emphasized structural design on a continuous scale from molecular dimensions to micrometer and macrometer levels.

Ilhan A. Aksay
Gary L. McVay
Donald R. Ulrich

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