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MATERIALS RESEARCH SOCIETY SYMPOSIUM PROCEEDINGS VOLUME 230

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# Phase Transformation Kinetics In Thin Films

Symposium held April 29-May 1, 1991, Anaheim, California, U.S.A.

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\*Invited Paper

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## Preface

This volume contains papers presented at the Materials Research Society Symposium on "Phase Transformations Kinetics in Thin Films" held in Anaheim, California from April 29 through May 1, 1991. This symposium provided a multidisciplinary forum for explorations, on experimental and theoretical levels, of thin film reactions and stability, phase nucleation and growth, and amorphization. The papers in this volume, refereed by the peer review process, are organized according to materials and techniques and do not reflect the order of presentations at the symposium.

Symposium sessions were organized in the areas of thin-film crystallization, solid-state amorphization, interfacial reactions, solid-state transformations, phase-change optical media and ferroelectric thin films. Six internationally recognized invited speakers reviewed some of the important problems in these areas including metal-mediated growth of Si, stress enhanced reactions, solid-state amorphization, phase-change optical recording, and ferroelectric materials for electronic applications.

Contributed papers ranged from theoretical determination of the limits to melt nucleation to commercial concerns of processing techniques for specific properties. Despite this breadth, the similarity of experimental techniques and thermodynamic underpinnings for most of the materials provided a common basis for discussions. As a result, a number of common themes arose from the sessions. For example, several papers described the formation of a disordered (amorphous) phase at an interface during annealing, both in traditional solid-state amorphizing metal couples such as Ni/Zr, and at metal-semiconductor interfaces such as Pt/GaAs. Theoretical models for solid state amorphization, based on a "mechanical melting temperature" or an "isentropic melting state," were also presented. Other common themes included first phase determinations, kinetic barriers to transformations, stress enhanced reactions, and point defect reactions. On the materials side, ferroelectric thin films for electronic dielectric applications emerged as a major new topic. Several papers discussed the control and understanding of the phase transformations (amorphous to pyrochlore and perovskite), as well as new growth and processing techniques (such as sol-gel precursors).

Overall, the symposium and these manuscripts reflect our rapidly advancing, and sometimes changing, understanding of thin film reactions. The abundance of new and unresolved questions, however, ensures that these topics will continue to be of considerable interest and importance.

M. Chen  
M. Thompson  
R.B. Schwarz  
M. Libera

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F. Spaepen	K.N. Tu
D. Wolf	K.A. Rubin
W.L. Johnson	J.F. Scott

We are also grateful for the efforts of the session chairs who successfully adhered to schedules and managed discussions of the technical program. They were:

K. Kavanaugh	M.O. Thompson
M. Nastasi	R.B. Schwarz
Y. Tyan	M. Chen
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