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Chemical Perspectives of Microelectronic Materials

Editors: Mihal E. Gross, Joseph M. Jasinski and John T. Yates

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# Chemical Perspectives of Microelectronic Materials

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## Preface

This volume is a compilation of contributed and invited papers presented at the symposium on "Chemical Perspectives of Microelectronic Materials." This symposium met for the first time at the 1988 Fall Meeting of the Materials Research Society in Boston from November 30 to December 2.

In creating this symposium, the organizers attempted to highlight the crucial role that chemistry plays in the preparation and manipulation of high technology materials used in microelectronics and to create a forum for communication across traditional disciplinary boundaries. Such communication is a vital key to progress in microelectronic materials research. As a result, this symposium contained a diversity of topics and research perspectives. The topics covered and the level of emphasis placed on each were determined at least as much by the participants as by the organizers. This volume presents a cross-section of current research activity at the interface between chemistry and microelectronics. It does not pretend to cover all possible aspects of that interface.

The papers in this proceedings are organized roughly by material system or chemical process, e.g. aluminum deposition, chemical vapor deposition mechanisms, silicon surface chemistry, novel precursors for metallization and compound semiconductors. One common theme throughout is the close relationship between gas phase, surface, and cluster chemistry. Reports on syntheses of novel organometallic precursors containing "tailored" leaving groups to deposit pure metal complemented mechanistic studies of chemical vapor deposition processes that addressed issues of deposit purity. Studies of reactions at clean silicon surfaces related to such microelectronics processing issues as deposition, etching, oxidation, and nitridation. Modelling of deposition reactions and the effect of reactor configuration on the mechanisms were also discussed. Areas such as plasma etching, laser processing, and photolithography, while not specifically excluded from this symposium and certainly heavily dependent on chemistry, are well enough defined specialties that they are subjects of separate symposia.

It is the organizers' hope that the symposium succeeded in making both chemists and non-chemists aware of the relevance of and potential for chemical studies in microelectronics. The enthusiastic response to this symposium presages increased participation by chemists in microelectronic materials research and increased interactions between chemists and materials scientists, physicists, and electrical engineers in all aspects of microelectronics research.

February, 1989

M.E. Gross  
J.M. Jasinski  
J.T. Yates, Jr.

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### Invited Speakers

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B.J. Aylett  
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K. Gamo  
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R.E. Smalley  
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We also thank the session chairpersons for their help in running the symposium:

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