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Microcrystalline and Nanocrystalline Semiconductors—2000

Editors: Philippe M. Fauchet, Jillian M. Buriak, Leigh T. Canham, Nobuyoshi Koshida
and Bruce E. White

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978-1-107-41294-1 - Materials Research Society Symposium Proceedings: Volume 638:
Microcrystalline and Nanocrystalline Semiconductors—2000

Editors: Philippe M. Fauchet, Jillian M. Buriak, Leigh T. Canham, Nobuyoshi Koshida
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PREFACE

Nanocrystalline (nc) and microcrystalline (μc) semiconductors are playing an increasing role in many areas of technology, such as deep sub-micron and nano-electronic devices, optoelectronics, photovoltaics, and chemical and biological sensing applications. The interest in structures on this length scale stems from their large surface area; the fact that their properties can be tailored by specifying their size, shape and surface chemistry; and the nearly complete freedom of design and manufacture that has recently been achieved.

This volume includes the proceedings of Symposium F, "Nanocrystalline and Microcrystalline Semiconductor Materials and Structures," held November 27–30 at the 2000 MRS Fall Meeting in Boston, Massachusetts. This symposium was the sixth in a series of symposia devoted to a comprehensive review of the state-of-the-art in materials science, physical and chemical properties, and device applications of nc and μc semiconductors. It served as a unique meeting place where materials scientists, engineers, physicists, chemists, and others can present their latest results and integrate progress in their respective disciplines with advances in allied fields.

The emphasis was on silicon and other column-IV elements and alloys, which continue to dominate the market place. Important advances continue to take place in the field, including breakthroughs in the theoretical understanding of the electrical, optical, and chemical properties, advances in the manufacturing of quantum dots, nanostructures, and films with the desired reproducibility, and an explosion of applications in very diverse fields. In addition to many of the topics that have been represented in previous symposia, such as the fundamental science of nanoscale silicon, silicon-based light emitting devices, and applications of porous silicon, this symposium saw a large increase of interest in silicon quantum dot electronic devices, quantum wires, nanocrystalline diamond, and sensors.

The organizers thank the invited speakers for their excellent presentations, the participants for their contributions and questions, and the referees for their work. We also thank Matsushita Electric Works and Motorola, Inc. for financial support.

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