Amorphous and Polycrystalline Thin-Film Silicon Science and Technology — 2009

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Amorphous and Polycrystalline Thin-Film Silicon Science and Technology — 2009

Symposium held April 14–17, 2009, San Francisco, California, U.S.A.

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PREFACE

Thin-film silicon materials and their alloys underpin a diverse range of electronic systems from active matrix flat-panel displays, through solar panels for "green-power" generation, to surface micromachined MEMS devices. Furthermore, new application areas are emerging, including RFID tagging and biosensors. As a consequence, large-area electronics is currently one of the fastest growing semiconductor technologies. Thin-film silicon can possess a diverse range of structures, from being fully amorphous to fully polycrystalline, as well as allowing mixed-phase states, such as micro- and nanocrystalline silicon. Such diversity has enabled this growth of large-area electronics, but it has also introduced complexity.

Symposium A, "Amorphous and Polycrystalline Thin-Film Silicon Science and Technology — 2009," held April 14–17 at the 2009 MRS Spring Meeting in San Francisco, California, has been running annually at the MRS Spring Meeting for over 25 years. This symposium provides a unique annual forum for scientists and engineers dealing with thin-film silicon materials, and their alloys with Ge, C, N, and other elements, to discuss issues related to both fundamental materials science and applied technology. The symposium opened with a full day tutorial looking at the deposition, characterization and physics of thin-film silicon materials in the morning session, followed by an afternoon devoted to studying the devices that use thin-film silicon. This was followed over the course of the next three and a half days by 15 invited talks, 52 contributed oral presentations and 71 poster presentations. This volume therefore acts as a good overview of the fields discussed, which ranged from studies of film growth and crystallization, through investigations on materials characterization, defects, metastability and carrier transport, to reports on devices such as solar cells and thin-film transistors. The importance of developing efficient solar cells was reflected in the significant number of papers that looked at aspects of improving lifetime and efficiency, and two focus sessions were devoted to light trapping in solar cells. The drive towards ever larger and more flexible substrates was also evident.

The organizers would like to thank all those who attended the symposium and contributed such excellent presentations. Particular thanks are due to the contributors and reviewers of this proceedings volume, and to the members of the Symposium A Advisory Group for their help and support. We would like to extend special thanks to Craig Taylor for his active role in organizing and providing administrative support for these symposia for over 15 years. We are also indebted to Mary Ann Woolf for all her help, advice and support in managing the construction of the symposium and the process of producing this proceedings volume. Finally, we would like to thank the Industrial Technology Research Institute, Taiwan for their generous financial support by sponsoring this symposium.

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