

Preface

This volume contains 74 contributions to the 6th International Autumn Meeting "Gettering and Defect Engineering in Semiconductor Technology" - GADEST '95, held from September 2 to 7 in Parkhotel Schloß Wulkow, Germany, and organized by the Institut für Halbleiterphysik Frankfurt (Oder) GmbH. The proceedings contain 20 invited and 54 contributed papers from more than 70 research institutes and universities in 23 countries. The 54 contributed papers were selected from more than 120 suggestions by the Program Committee. It is the aim of this conference to give a representative survey of the present state of knowledge within the topic of the conference, as documented in these proceedings.

The ten years of the GADEST (1985 to 1995) were accompanied by significant progress in the semiconductor electronics industry as well as advances in the material science of semiconductors.

Defect control and defect engineering have by now become an important sector of modern semiconductor technology. They play a central role in stabilization, the development of new processing steps, and the tuning of special device parameters and thereby are a major factor determining the yield and performance of integrated circuits. These considerations originally were studied in the context of monocrystalline silicon, but they have meanwhile been extended to compound semiconductors and multicrystalline silicon. Also, many other processes are now under investigation besides gettering.

At the present time, Si-based technology is experiencing the transition to the next generation of substrates with a diameter of 300 mm. The fundamental physical limits are being approached in terms of miniaturization, increased chip area, faster switching speeds, and diversity of operations. This raises the question of the intrinsic limits of the currently dominating semiconductor, silicon, and under what circumstances it is advantageous to turn to other materials such as GaAs, InP, or SiC.

Using the integration of heterostructures into the established silicon technology - whereby SiGe is a promising approach - it is expected that operational frequencies can be attained which previously were the exclusive realm of compound semiconductors. Additionally, the use of heterostructures can reduce the vertical device dimensions, making this approach of interest for advanced CMOS variants with lateral structures below 0.2 μm as hetero-CMOS for fast integrated circuits. The influence of new deposition techniques and low-temperature processing, process-induced defects, contamination by metals, and mechanical strain pose demanding new questions for defect engineering. Application of gettering to multicrystalline silicon to be used for solar cells poses a special challenge because the material must be improved throughout the complete thickness of the wafer.

The progress in the field of semiconductor materials science is closely connected with the development of new and the improvement of existing characterization techniques, towards atomic dimensions on one side and the possibility to characterize semiconductor wafers with increasing diameter on the other side.

The large interest engendered by the conference in the past emphasizes once again the fundamental importance of a meeting which serves as a forum for scientists and engineers working at universities, research institutes, and industrial laboratories in the east and the west, both for providing deeper insight into defects in semiconductors and for discussing up-to-date effects and procedures of gettering and defect engineering.

We express our sincere thanks to all authors who contributed to the proceedings. The organizers are also deeply indebted to the sponsors for their support and to all those who are involved in the organization of the conference for their dedicated work. Finally, we like to mention that the 7th International Autumn Meeting will be held in 1997.

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