Preface

Silicon carbide (SiC) is a unique semiconductor with the ability to form polytypes, each characterised by a specific stacking sequence of Si–C bilayers. Among these, the 3C, 4H, and 6H polytypes are of particular technological importance due to their outstanding electrical, thermal, and mechanical properties, making silicon carbide a key material for high-performance electronic devices.

One of the most significant challenges in SiC crystal growth and epitaxy is the formation of planar defects, known as stacking faults, arising from local deviations from the ideal stacking order. These defects adversely affect carrier transport and device reliability of power devices.

The special edition focuses on the investigation of the various stacking faults found in SiC polytypes, analysing their crystallographic nature, formation mechanisms, characterisation methods, and their influence on device properties. By deepening understanding of the conditions that promote the development of these defects, researchers and engineers can improve the quality of SiC substrates and epitaxial layers, supporting the continued advancement and modernisation of related semiconductor technologies.

The presented edition will be helpful for a wide range of specialists in the semiconductor industry.

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