

Preface

Advances in materials science play a central role in the development of modern technologies. This special edition introduces the results of groundbreaking research across four areas of materials engineering: materials for functional applications, materials for energy conversion and energy storage devices, corrosion behaviour and functional coatings of structural materials, and the strength of materials and structural mechanics.

The first chapter, "Materials for Functional and Specialised Applications", is focused on the research and development of advanced materials tailored for specific technological and technical needs. The carbon nanomaterials for microwave absorption, nanohybrid structures for gas sensing, Moiré lattices for photonic application, etc., are investigated in this section.

The second chapter, "Materials and Technologies for Energy Conversion and Energy Storage", presents achievements in the development of materials for applications in high-efficiency batteries. This chapter highlights the significance of material innovation for global energy demands.

The third chapter addresses one of the most enduring challenges in engineering - corrosion behaviour and protection of structural materials. It presents results in steel and brass corrosion resistance research and the development of low-emissivity coatings for thermal management applications.

The fourth chapter, "Strength of Materials and Structural Mechanics", analyses the mechanical properties of governing structural materials performance under various loads and stresses.

This special edition will be useful to specialists in materials science, machinery, electronics and structural engineering.