

Preface

The advancement of materials science and technologies has been pivotal in addressing the goals of industrial development and environmental concerns in today's world. This special edition explores two domains: i) analysing properties and processing technologies of structural metals and ii) environmental remediation materials and technologies, each contributing uniquely to the progress of sustainable development.

Articles from the first chapter examine and analyse structural metals' properties and their processing technologies as foundational elements of modern infrastructure creation. Beginning with conventional steel and alloys that have long been used in industries such as construction, transportation, and machinery, this chapter also explores the industrial potential of advanced structural metals - high entropy alloys, friction stir welding joints, etc. These advanced materials, engineered for superior strength, corrosion resistance, and lightweight properties, are pushing the boundaries of performance in high-demand applications.

The second chapter addresses some solutions for one of the most pressing challenges of our era – environmental pollution. In response to growing concerns over air, water, and soil contaminants, innovative materials are being developed to capture and neutralize pollutants effectively. This chapter provides an in-depth examination of advanced materials, including nanomaterials, adsorbents, and catalytic compounds, engineered for environmental remediation. Additionally, it explores emerging technologies that increase the effectiveness of pollutant removal processes.

This special edition aims to serve as a resource for researchers, engineers, and practitioners committed to developing materials and technologies for sustainable development.