

Preface

This special topic edition represents articles on the research results in the synthesis, properties research and processing technologies investigation for a comprehensive nomenclature of recent polymeric and composite materials, functional and special materials for various application goals, and structural alloys.

The first chapter explores the properties and synthesis technologies of natural polymers, bio- and nanocomposites and structural metal matrix composite materials intended for wide application in mechanical engineering.

The next chapter contains articles devoted to analysing properties, synthesis technologies and treatment methods for some functional and special materials used in a heat-protective clothing package, for microelectronics as materials with high electrical conductivity, in thermal insulation, etc.

The last two chapters are devoted to modern structural alloys and tribological research. Precision analysis of superalloy Incoloy 901 machining with cemented carbide tools, the review technologies for synthesis and processing magnesium-based alloys for biomedical application and the tribological study and testing of polyphenylene sulfide rolling bearings and investigation of crack growth in ceramics balls under compressive-tensile cyclic loadings are presented in these publication parts.

The specialised edition will be helpful to many engineers and researchers from machinery, microelectronics and materials development.