

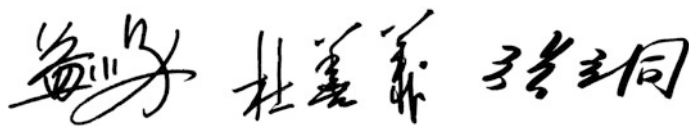
Preface

The concept of composites is well illustrated by biological materials such as wood, bone, teeth, and hides; these are all composites with complex internal structures that provide mechanical properties well suited to the performance requirements. In general, heterogeneous materials combining the best aspects of dissimilar constituents have been used by nature for millions of years. These could be considered the first composite materials. In modern materials engineering, the term ‘composite’ has become a broad and important class of engineering materials, typically referring to a matrix material that is reinforced with fibers. For instance, GFRP is a thermosetting polyester matrix containing glass fibers, and this particular composite has the lion’s share of today’s commercial composite market.

Nowadays, composite materials are found in a wide variety of situations, and they play important supporting roles in economic development and defense applications. Many composites used today are at the cutting edge of materials technology, with performance and costs appropriate to ultra-demanding applications such as spacecraft. Composite materials are undoubtedly a pillar of the materials family, parallel to metallic, polymeric, and nonmetallic inorganic materials, in terms of the worldwide demand and production. Composite materials are so fundamental and so critical that their importance is hard to overemphasize.

The main objective of the book is to provide a comprehensive overview of current composite materials that have considerable influence on technical and economic development in China. Many achievements presented in this book result from individual research groups and research and development projects financially supported by Chinese government. Hence, one aim of this book is to bring state-of-the-art knowledge and accomplishments on composite materials together in a single book of two volumes. Of course, this book also provides an understanding of the physical structure–properties relationship of composites for postgraduate students and researchers, scientists, and engineers alike. This understanding forms a basis for the application and improvement of the properties, manufacturing processes, characterization and testing, selection methods, and design of products made from composites. This knowledge has evolved from many disciplines and is common to all composite materials.

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Three handwritten signatures in Chinese calligraphy, arranged horizontally. The first signature on the left is 'Xiao Su Yi', the middle one is 'Shanyi Du', and the one on the right is 'Litong Zhang'.

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