

# Preface

Today, it is usual to define nanocomposite “as a multiphase solid material where one of the phases has one, two or three dimensions of less than 100 nm or structures having nano-scale repeat distances between the different phases that make up the material”. Recently, the use of nanocomposites with polymer, metal or ceramic matrices has increased in various areas of engineering and technology due to their special properties, with applications in bioengineering, battery cathodes, automobiles, sensors and computers, as well as other advanced industries.

Tribology is defined as “the science and technology of interacting surfaces in relative motion” and embraces the study of friction, wear and lubrication. Within the tribology literature of nanocomposites wear rate and friction coefficient are generally reduced with the addition of nanoscopic filler particles for all matrices with special emphasis in polymer matrices. Friction coefficients and wear rates are often discussed in nanocomposites tribology.

The [Chap. 1](#) of this book provides tribology of bulk polymer nanocomposites and nanocomposite coatings. [Chapter 2](#) is dedicated to nano- and micro-PTFE for surface lubrication of carbon fabric reinforced polyethersulphone composites. [Chapter 3](#) describes Tribology of MoS<sub>2</sub>-based nanocomposites. [Chapter 4](#) contains information on friction and wear of Al<sub>2</sub>O<sub>3</sub>-based composites with dispersed and agglomerated nanoparticles. Finally, [Chap. 5](#) is dedicated to wear of multi-scale phase reinforced composites.

This present book can be used as a research book for final undergraduate engineering course or as a topic on materials at the postgraduate level. Also, this book can serve as a useful reference for academics, tribology and materials researchers, materials, physics and mechanical engineers, professional in nanocomposites and related industries. The interest of scientific in this book is evident for many important centres of the research, laboratories and universities as well as industry. Therefore, it is hoped this book will inspire and enthuse others to undertake research in this field of tribology of nanocomposites.

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