## Preface

The field on nanotechnology is still in its infancy but continues to progress at a much faster rate that any other field. Many methods to synthesize nano particles, disperse them in a carrying fluid to form a composite and exploit its extraordinary properties is the goal and dream of many researchers engaged in this field. It is not possible to cover every nano particulate matter and its role in materials revolution. The approach adopted here was to focus on carbon nanotubes and nano clays and explore their importance and their role in composites. Hence the chapters presented in this book address processing, rheology, mechanical properties and their interaction with fiber composites. Thus, this book is a collection of nine chapters written by researchers who are at the forefront of their field which address the role of nano particles in composites. The first three chapters focus on the use of Carbon nanotubes in a composite. Chapter 1 is a succinct summary of the state of the art of the carbon nanotubes in composites. Chapter 2 focuses more on the aspects of processing with these nano particles in a suspension. Most research is focused in using these nanotubes sparingly in the composite and exhibit disproportionally better properties. Chapter 3 focuses on how to address higher loadings of these nanotubes and develop nanostructure materials. Chapter 4 explores the interaction between traditional fiber composites and use of nano particles in them in terms of benefits and property enhancement in addition to processing of such materials. Chapter 5 discusses in detail the rheology of suspensions that contain nanofibers and how one can modify existing models to describe their flow behavior. Chapters 6 through 9 address nano clay composites. Chapter 6 is a good overview of the state of the art of the nanoclay usage in various resins and composites. Chapter 7 focuses on the mechanical and physical property characterization of polymer clay nanocomposites.

Chapter 8 discusses further use of nanoclays in thermoplastics and their use in glass fiber composites. Chapter 9 describes methods to prepare nanoclay suspensions with thermosets and the corresponding enhancement in properties. I would like to thank all the authors and reviewers in making this project into reality.

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