

Preface

A large amount of innovative works & efforts are being undertaken by scientists and engineers worldwide to meet ever-increasing demand for improved materials, to speed up the R & D of new materials, and to facilitate the practical applications of emerging new materials. This book thus attempts to provide an in-depth coverage of current trends in a wide range of areas in material science and engineering, spanning from new material design and characterization, to material manufacturing process optimization, to computer-based material simulations. The targeted readers are academia and industrial researchers and engineers who need to keep abreast of most recent advances in these important topic areas .

In essence, this book contains 46 papers accepted for presentations in 2013 *International Conference on Materials Engineering* (ICMEN2013), which was held in the beautiful city of Nanjing, China, between May 17th and May 19th, 2013. These papers have touched upon the present and future trends, and hot topics in materials engineering, such as fast synthesis and characterizations of new engineering materials, structural-property relationship, materials processing technologies, and material-related theories (including modeling, PC calculations, performance prediction). In particular, there are quite some noteworthy findings in this book. To name a few, the works on wood plastic composite, HPLC for deep analysis for tinidazole pills, and modification of spherical particles calcium sulfate for alveolar bone defect are all quite innovative.

You may have sensed that this book touches so many diversified, truly multidiscipline areas in material science/engineering. As so, we made an effort to put relevant information in a coherent manner. This book thus has been edited to consist of four sections. The first section focuses on Energy and Environment Materials, while the second includes papers dealing with Function and Electronic Materials. Papers concerning High Performance Structural Materials are put into Section III. The last section is a collection of papers on Materials Processing Technology, including Material Processing and Handling, Semiconductor materials manufacturing, Fatigue and Fracture, and Maintenance, and so on so forth.

Herein, we would like to sincerely thank all the authors for sharing with us their new ideas, research results, industry experience and best field practices. Our special thanks also go to all the reviewers in evaluating and selecting all these high quality papers. Without their valuable input and due diligence, publication of this book would not be possible. Last but certainly not the least, we are grateful to Dr. Thomas Wohlbier and Dorthe Kristensen at Trans Tech Publications for all the valuable assistance with other publication-related logistics.

We hope that you will find that reading this book can be as enjoyable as we did.

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