

Preface

Materials Engineering Research

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Developments in materials engineering is a significant research area throughout the world at any time. Continuous advancement in various industrial sectors are the main results of materials engineering research. This book includes five chapters covering recent research in materials engineering includes green inhibitors, important of controlled heat treatment on component performance, MCDM for selection of better composite, use of phosphogypsum in concrete and possible conditions leading to the formation of Alkali-Silica Reaction in Hot Mix Asphalt.

First chapter is authored by Shiv Kumar Manu and R. Manivannan and they prepared an exhaustive most fascinating characteristics of some green inhibitors published over the last decade of work on the use of eco-friendly polymer-based materials and phytochemicals as an inhibitor for mitigating corrosion in various types of metals in acidic/biological mediums.

Rahul Nagar et al. investigated the significance of heat treatment in enhancing the lifespan of manganese steel cone crusher liners in second chapter. They produced new liner castings by controlling critical heat

treatment parameters and tested their performance by using it at the crushing site. The throughout monitored results and their evaluation indicated a significant improvement in wear life, resulting in cost benefits for the end customer.

Third chapter is presented by Ranjan Kumar et al. who have developed a diversity of multi-criteria decision-making tools to support the designers in their decision-making process for the choice of Al 6061-Fly ash-TiO₂ composite in their design. They made an attempt to select the best composite combination for better mechanical performance using TOPSIS. Response Surface Methodology is also used for theoretical model and multi-objective optimization.

Shishir Kumar Sikder Amit et al. presented a study on the potential of using phosphogypsum, an industrial by-product, in concrete as an environment-friendly sustainable solution. Various percentages (5 to 20) of phosphogypsum have been used as a replacement of Portland cement to produce cost-effective SCC with favorable properties and strength in fourth chapter.

Fifth chapter authored by Duygu Demirtürk, investigates possible conditions leading to the formation of Alkali-Silica Reaction in Hot Mix Asphalt. This study highlighted the need for innovative and comprehensive approaches to measure Alkali-Silica Reaction in Hot Mix Asphalt.

The chapters presented in this book will be useful for the researcher and postgraduate student working in the field of materials engineering.