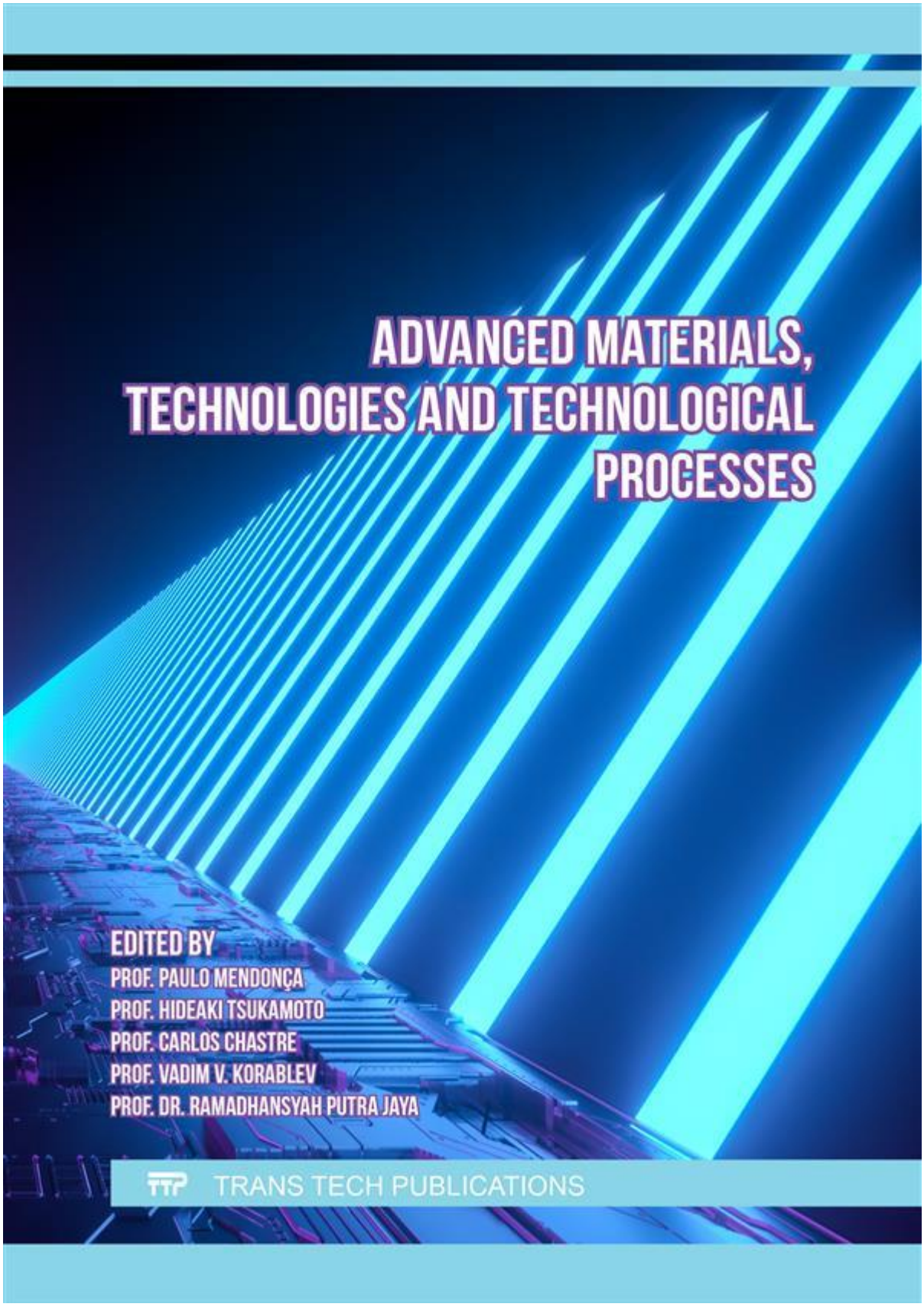
ADVANCED MATERIALS, TECHNOLOGIES AND TECHNOLOGICAL PROCESSES
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Preface

This special edition is devoted to materials science and technologies of materials synthesis and processing.

Additive technologies such as direct laser deposition and selective laser melting are investigated for the case of application in alloy synthesis in the first chapter. The properties of obtained samples were also analysed.

The book's next chapter includes research articles exploring the results analysis of the application of modern technological processes for materials treatment. Here are examined the constructional steel ultrasonic impact treatment at negative air temperatures, the process of forming briquettes from iron and plastic waste and the welding of structural steel at low temperatures.

The surface modification of nickel oxide thin films obtained by gas-phase deposition and the crystallisation conditions on the as-cast structure of a shape memory alloy are explored in the third chapter.

The next four chapters are devoted to biomedical research, the investigation of aggregate replacement materials in concrete production and actual engineering issues in structural engineering, structural mechanics and geotechnics.

This special publication will interest materials science, machinery, biomedical engineering and construction specialists.

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Properties of sustainable concrete containing recycled fine aggregate as partial sand replacement

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ABSTRACT

River sand, one of the ingredients for concrete when harvested uncontrollably from the river would cause destruction to the river environment. At the same time, the increasing concrete waste disposed at dumpsite after generated from construction and demolition activity causes environmental pollution. The approach of recycling concrete waste for use as a mixing component in concrete production would lessen the heavy reliance on natural sand supplies and lower the amount of concrete waste disposed. The current study investigates the effect of recycled fine aggregate obtained from concrete waste as sand replacement on concrete's workability, compressive strength, and water absorption. Five mixtures were made using varying amounts of recycled fine aggregate (0, 10, 20, 30 and 40% by weight of sand). All specimens were subjected to water curing. Three types test were conducted namely slump test, compressive strength test and water absorption test. Findings show that the integration of recycled fine aggregate up to 20% produces concrete with the targeted strength of 40MPa. Furthermore, the water absorption of the mixes is less than 3%, allowing it to be classified as good quality. Success in blending recycled fine aggregate in concrete production would contribute to saving river sand consumption and lesser concrete waste for a cleaner environment.

KEYWORDS

Compressive strength; Concrete; Concrete waste; Partial sand replacement; Recycled aggregate

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