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DEVELOPMENT OF C&DD-BASED GEOPOLYMER PRODUCTS – A PRACTICAL APPROACH

Ivana Jelić⁹⁵; Aleksandar Savić⁹⁶; Marija Šljivić-Ivanović⁹⁷; Slavko Dimović⁹⁸

Abstract

Construction and demolition debris (C&DD) is among the fastest-growing waste streams due to accelerated urbanization processes and overall economic development. Accordingly, developing attractive and cost-effective methods and creating more valuable technologies that could use this waste type more efficiently and solve possible environmental problems is one of the main challenges in research nowadays. The C&DD-based materials design has attracted the attention of researchers, offering to reduce the impact of production on the environment. The benefits arising from this concept include the reduction of C&DD in municipal landfills and the preservation of large quantities of natural raw materials, e.g. cement, aggregates, and water. Hence, the production costs, energy consumption, and carbon footprint could be reduced simultaneously. However, the results of this promising technology are not sufficiently integrated into actual practice. This new material development concept proposes a four-step approach. The first phase involves designing a mixture for the geopolymer material. The second phase consists of basic physico-mechanical properties determination: density, absorption, and compressive strength. The next stage implies durability testing. The fourth step, often omitted in basic research, suggests the best geopolymer formulations for the delivery and investigation of eco-friendly and marketable prefabricated building product prototypes, for various applications, e.g. pavements or wall blocks.

Key words: *Reuse, recycle, waste, debris, construction.*

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