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VALORIZATION OF MUNICIPAL WASTEWATER TREATMENT PLANT SLUDGE AND AGRO-WASTE IN BUILDING MATERIALS WITH THERMAL INSULATION PROPERTIES

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Abstract

Considering the actual environmental issues, the waste management has become a major challenge in Europe and worldwide. Recycling the waste into sustainable products can be an alternative to landfill with positive effects on the costs and environmental pollution. In this respect, in the last years numerous studies and research emphasize the utilization of different type of waste to obtain materials for building applications. The aim of this paper is to assess the effect of using sewage sludge generated by the wastewater treatment plant (WWTP) of Brăila city and waste from agro-waste of rapeseed stems as a partial replacement for clay, on thermal insulation properties of conventional building materials. The composite samples of 90 x 90 x 10 mm size, using clay and various proportions of sewage sludge and rapeseed waste (dried and grinded) were obtained in laboratory. The composite samples air-dried and calcinated for 1 hour at 950°C were characterized regarding the specific properties of construction material such as water absorption capacity, thermal conductivity, bulk density and liability to efflorescence. The obtained results emphasize that the inclusion of sewage sludge and rapeseed waste increases the water absorption and weight loss on ignition as results of large pores size formed in the composite material structure. This structure leads to decreasing of the density and thermal conductivity that gives good thermal insulation properties for tested samples.

Key words: composite materials, rapeseed waste, sewage sludge, thermal insulation

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