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On the use of different wastes to formulate mortars for sustainable building materialsAndrea Sacconi¹, Stefania Manzi¹ and Isabella Lancellotti²^{1,2}University of Bologna, Italy

Circular economy and low-impact materials production are the desired targets of the future. In the field of building materials, Portland cement based mortars are being questioned because of their high CO₂ footprint. Geopolymers matrix may offer an alternative to the traditional binders, particularly when deriving from industrial wastes. In the present study, the possibility to formulate alkali activated blends made of metakaolin and up to a 50 % wt, bottom ashes deriving from urban waste incinerations is investigated. Moreover, to increase the mechanical properties in particular to reduce brittleness and increase flexural strength and increase the dimensional stability of mortars scraps deriving from the production of epoxy-carbon fiber have been recycled in the same materials without any chemical or high temperature treatments. Positive results have been obtained thus supporting this recycling route.

Recent Publications

1. Bursi, E., Barbieri, L., Lancellotti, I., Sacconi, A., "Lead waste glasses management: Chemical pretreatment for use in cementitious composites" *Waste Management Research* 35, 2017, 958-966
2. Sacconi, A., Manzi, S., Lancellotti, I., Lipparini, L., "Composites obtained by recycling carbon fibre/epoxy composite wastes in building materials" *Construction and Building Materials* 204, 296-302, 2019.
3. M.C. Bignozzi, A. Sacconi, I. Lancellotti, L. Barbieri, "Glass waste as supplementary cementing materials: the effects of glass chemical composition", *Cement and Concrete Composites* 55, 45-52, 2015.
4. I. Lancellotti, C. Ponzoni, L. Barbieri, C. Leonelli "Alkali activation processes for incinerator residues management" *Waste Management* 33, 1740-1749, 2013.
5. I. Lancellotti, C. Ponzoni, M. Bignozzi, L. Barbieri, C. Leonelli "Incinerator Bottom Ash and Ladle Slag for Geopolymers Preparation" *Waste Biomass Valorization* 5, 393-401, 2014.

Biography

Andrea Sacconi is Associate professor at the University of Bologna. His main interests are composite materials formulated either with organic or inorganic polymers. He has studied the possibility to recycle different types of urban and industrial wastes, investigating the effects on mechanical properties and durability. He has published 70 papers on international peer-reviewed journals (Scopus).

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