Sustainable glazes for ceramic tiles: exploiting inertized rock and glass wool waste as resources

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S6) Ceramics and sustainable development / Recycling

Lecture

We have developed sustainable ceramic glazes by using the thermal inertization products of man-made vitreous fibres (MMVF) as secondary raw materials. In recent years, the ceramic sector has increasingly focused on resource optimization and waste recycling. In line with the principles of a circular economy, the production of ceramic tiles using "extramuros" waste, such as the products of thermal inertization of rock wool and glass wool, has become a central theme. These waste materials, characterized by being completely amorphous, serves as an ideal melting component in ceramic products. We have experimented with various formulations of ceramic glazes, incorporating between 40% and 50% of these glassy materials. The two most promising formulations involves in one case the exploitation of 44 wt% of waste resulting from the thermal inertization of rock wool and in the other use of 40 wt% of waste resulting from the thermal inertization of glass wool. We tested the waste materials as they were and after the introduction of some pigments. The final results lead to lustrous ceramic glazes, characterized by different colours: black, cream, pink and blue. All the materials were deeply investigated in terms of chemical and mineralogical composition, stability and dilatometric behaviour. These outcomes underscore the suitability of these waste materials as valuable secondary raw materials for the manufacture of traditional ceramic glazes.

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