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ABSTRACT TO THE WORKSHOP: VITROGEOWASTES, Elche, sept 2017

Development of a glass-ceramic glaze formulated from industrial residues to improve the mechanical properties of the porcelain stoneware tiles.

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ABSTRACT

In this research a mixture of 90%wt of industrial residues (recycled soda-lime glass and ashes from a coal power thermal plant) have been vitrified for their use as "secondary raw material". Then, a glaze suspension was prepared to be applied as a glaze suspension on the porcelain stoneware tile. The tested pieces have been fired by a conventional porcelain cycle at 1180ºC of maximum temperature. The XRD, XRF, SEM/EDS and the dilatometric analysis have been the instrumental techniques used to characterize the final material. Finally, an ecological glass-ceramic glaze perfectly fitting on porcelain ceramic tile has been produced, exhibiting a unique phase, anorthite, which ensures a high flexural strength (around 96 MPa) and a significant Vickers microhardness of 250 GPa, improving the mechanical properties of a conventional the porcelain ceramic tile.

Keywords

Circular economy, revalorization of industrial waste, glass-ceramic glaze, porcelain stoneware, mechanical properties