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METALLURGICAL WASTE VALORIZATION FOR FABRICATING GLASS-CERAMICS MATERIALS

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Abstract

The valorization of a metallurgical waste (i.e., an iron-rich slag) as raw material for the fabrication of high hardness glass-ceramics was investigated using differential thermal analysis, X-ray diffraction, X-ray fluorescence and scanning electron microscopy. The melting of the slag was aided by the addition of waste glass cullet (WGC) and the vitrification field of this system was investigated. The non-isothermal crystallization kinetics of the parent glass with the highest slag content were studied by DTA and crystallization of the parent glasses led to of pyroxenic crystalline phases, suggesting the application of the obtained glass-ceramics as building materials. Environmental benefits such as the reduction in the consumption of virgin raw materials and the elimination or even reduction of CO_2 and SO_2 emissions due to absence of carbonates and sulphates in the batch compositions make interesting the application of this technology.

Key words: CO_2 emission reduction, construction materials, glass-ceramics, metallurgical slag

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