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“CLEANER PRODUCTION TOWARDS A SUSTAINABLE TRANSITION”

Incorporation of Industrial Wastes in Bricks

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Abstract

This article presents a case study conducted as an experiment with the incorporation of different kind of wastes in the production of bricks (red building ceramics). Three types of wastes were directly mixed with clay: automotive waste sludge (AWS) containing concentrations of heavy metals, glass waste (GW) consisted primarily of microspheres (from a galvanic plant) and wood ash (WA) from a pottery furnace. The materials used in the formulation were analyzed by X-ray diffraction (XRD), X-ray fluorescence (XRF) and scanning electron microscope (SEM). They were separately dried, milled and then dry mixed. Water was added to contribute to the compaction process, to obtain the samples. Samples were dried and then heated to similar temperatures to those used in firing kilns bricks. The resulting ceramics were analyzed for dimensional and then subjected to flexural resistance test which presented results above of 4 MPa. To assess the environmental impact caused by the samples obtained, they were analyzed by XRD, XRF and SEM. At the end, leachability and solubility were realized to evaluate the chemical aspect of the obtained ceramic. According to Brazilian standards, the tested sample achieves the conditions to be classified as inert. In conclusion, it means that this new ceramic has conditions to be classified as capable to be produced. However, it is necessary to evaluate how a production in large-scale will behave.

Keywords: *industrial waste, recycling, environmental friendly materials,*

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