

RECYCLING OF GREEN PROCESS WASTE IN PORCELAIN TILE

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ABSTRACT

In recent years the use of environmentally-friendly products has become an essential aspect in the ceramic industry. Therefore, waste management in tile manufacturing has also become an important issue. Every production system creates waste products which can affect the environment. Body and glaze preparation also glazing lines are the main sources of green process waste in traditional ceramics processes. The aim of the present research was to use the green process wastes as raw materials in the production of glazed porcelain tiles. Waste material was characterized using XRF and XRD. In order to determine the thermal properties of the developed bodies TGA/TG measurements were carried out. The vitrification behavior was evaluated using a double-beam optical non-contact dilatometer. XRD was also used the phases after firing. Microstructural and micro chemical characteristics of the fired bodies were observed using scanning electron microscopy (SEM). Finally, the physical, mechanical and colour properties of formulations, such as water absorption, linear shrinkage, breaking strength and chromatic coordinates were measured. The results showed that it is possible to develop porcelain tile body with suitable technological properties by using appropriate mixture of process wastes and fired porcelain tile wastes in the body composition.

KEYWORDS: Process waste, recycling, environmentally friendly