RESUMEN Nº 13

PRODUCTION OF ZIRCON-FREE OPAQUE WALL TILE FRITS AND THEIR USE IN CERAMIC INDUSTRY

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Wall tile glazes with a smooth surface texture, high glossiness, and whiteness are usually based on zirconium containing frits. However, these frits are quite expensive and using glass-ceramic glazes is a possible alternative for decreasing the production cost. The glaze compositions belonging to the K_2O-MgO-CaO-ZnO-Al_2O_3-B_2O_3-SiO_2 system were studied to prepare new wall tile glazes. Design of a glass-ceramic glaze for this type of tiles should ensure that the selected frit precursor is technically and commercially compatible with the manufacturing conditions generally used in the production of glazed ceramic wall tiles. The aim of the study was to gain opacity by designing a new, alternative glass-ceramic glaze system by optimising the CaO/MgO ratio and adapt them to the industrial working conditions. Glaze preparation, application, and fast single-firing of wall tiles were, first of all, conducted under laboratory conditions and then successful recipes adapted to the industrial working conditions. The frit crystallization capability and crystallization temperature range were determined by differential thermal analysis (DTA). Characterization of glass-ceramic glazes was made by x-ray difraction (XRD), scanning electron microscopy (SEM) and energy dispersive x-ray (EDX) techniques. Colour analyses were done with a spectrophotometer.

Keywords: Zircon, Elimination, Frit, Opacity.

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