

PROCESS ENGINEERING

Differences in Vitrification Behaviour of Flint and Opaque Scrap Glass Containing Porcelainized Stoneware Body

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In a normal stoneware ceramic composition, feldspar was partially substituted by two types of soda lime silica scrap glass powder (flint-chromium free and opaque-chromium doped). Samples were fired in the temperature range of 1100–1250 °C and their physico-mechanical properties were studied and compared with the normal composition. Samples containing flint glass powder achieved early vitrification at 1200 °C compared to

tives for special purpose. In porcelain composition, clay provides fine particles which act as binder and good plasticity to give shape and green strength to the body. Feldspar acts as a flux, forming a viscous liquid or glass at commercial firing temperature (~1200–1300 °C) and leads to vitrification. The quartz is mainly a filler and improve mechanical property of the fired material. The toughness, strength, and translucency of porcelain arise mainly from the formation of glass and mullite crystals within the fired body at these high temperatures.

Iqbal and Lee [7] found that clay component dehydroxylated to metakaolin at 550 °C and metastable sanidine formed from decomposition of the feldspar at about 600 °C and dissolved at about 900 °C. Li-

ray tubes (CRTs), and a barium based glass from CRT panels. Replacement of feldspar sand with a soda lime scrap glass, in the range 5–10 mass-%, showed a slight decrease in the water absorption of the fired material at the same vitrification temperature as the reference mix. Furthermore, flexural strength remains high and the microstructural homogeneity enhances reliability. The presence of 2 and 5 mass-%, of lead and barium based scrap glass respectively, both characterised by lower liquid viscosity at higher temperature, resulted a significant decrease in the vitrification temperature of the modified porcelain stoneware products while maintaining good mechanical properties.

Tucci et al. [9] also reported that the replace-

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| <p>Ajanaku K. Oluseyi, M. Pal, Swapan K. Das (2015) Differences in Vitrification Behaviour of Flint and Opaque Scrap Glass Containing Porcelainized Stoneware Body. <i>Process Engineering: Ceramic Forum International DKG</i> 92(3): 31-34.</p> | <p>The paper describe the physico-mechanical and the morphological properties of two types of soda lime silica scrap glass powder (flint-chromium free and opaque-chromium doped) in the formation of composite body. The two samples were fired at the same temperature to observe the differences in properties.</p> | <p>(IF = 0.18) (Indexed in others)</p> |
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