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HIGH PERFORMANCE ZrSiO₄ PARTICULATED-REINFORCED LZSA GLASS-CERAMICS MATRIX CERAMIC FLOOR TILE

F. M. Bertan¹; O. R. K. Montedo¹; D. Hotza²; A. P. Novaes de Oliveira³
E-mail: pedronovaes@emc.ufsc.br

¹SENAI/CTCmat - Center of Technology in Materials, Rua General Lauro Sodré, 300 – PO Box 3247, Bairro Comerciário, 88802-330 Criciúma (SC), Brazil

²Department of Chemical Engineering (EQA)

³Department of Mechanical Engineering (EMC)
Federal University of Santa Catarina (UFSC),
PO Box 476, 88040-900 Florianópolis (SC), Brazil

Abstract

This work has as main objective to characterize a ZrSiO₄ particulate-reinforced LZSA (Li₂O-ZrO₂-SiO₂-Al₂O₃) glass-ceramic matrix added with bentonite and formed by extrusion as ceramic floor tile. The glass batches and composites were characterized on the point of view of their typical physical/mechanical and chemical properties. Composition with 60 wt% ZrSiO₄ was selected, preliminary, since it showed the best results in terms of bending strength (190 MPa) and deep abrasion resistance (51 mm³). The same composition as before but added with 7 wt% bentonite was selected for further studies since it showed the highest plasticity index generating consequently good billets after extrusion process. In this last case, the extruded samples, after sintering at 1150°C for 10 min, showed a thermal linear shrinkage of about 14% and deep abrasion resistance and bending strength of about 51 mm³ and 220 MPa, respectively.

Keywords: Extrusion, glass-ceramics, sintering, crystallization.

