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The effect of binder and pressure on the preparation of recycled soda lime silica glass composite bodies

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Abstract

This study exploited the use of waste soda lime silica glass as an alternate material for making paving tiles. Compositions containing at least 90% recycled glass from 106 microns and minus 75 microns soda lime silica glass powder were prepared. Water, sodium silicate and bentonite were added as the binders and three sets of compacts were made. The first containing water, the second containing sodium silicate and the third set containing bentonite and these were pressed using the uniaxial press method at 5,000 psi and 10,000 psi. The compacts were sintered at a temperature range of 600^{o}C – 800^{o}C and tested using the American Standard Test Methods for shrinkage, warpage, absorption and strength. Results show that the composite body containing bentonite as binder and pressed at 10,000 psi had the best green strength, greatest fired strength and also lowest shrinkage value. It is therefore deduced that composite body from waste soda lime silica glass, with the addition of bentonite as binder and pressed at 10,000 psi will make good quality paving tiles.

Biography

Adele Dzikwi Garkida obtained her BSc Industrial Design (Glass Technology) from Ahmadu Bello University Zaria, Nigeria in 1989. She also obtained her M.A Industrial Design (Ceramics) in 1998 and PhD in Industrial Design (Glass Technology) in 2007 from the same institution. She was at Michigan Technological University from 2005 -2006 as a Fulbright Scholar. She is presently a Senior Lecturer at the Department of Industrial Design, Ahmadu Bello University Zaria, Nigeria and is involved in teaching at the undergraduate and postgraduate levels. She is a member of some professional organizations which includes Ceramics Association of Nigeria (CerAN), The Minerals, Metals and Materials Society (TMS). She has a number of journal articles and has also attended and participated at several conferences at local and international levels.