

The Effects of Inter-Blending with Calcined Al₂O₃ on the Ceramic and Refractory Characteristics of some Trinidad Clays

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Abstract

Currently, there is interest in developing high-grade ceramic and refractory products from raw materials indigenous to the Caribbean region. To this end, the fired physical and mechanical properties of a high plasticity and a low plasticity Trinidad clay (respectively from Cocoloco Estate within the Talparo deposit and the Valencia deposits) blended to cover the range of composition 0 - 100% of one in the other have been studied after firing at 1100°C. Similarly, blends covering the range 0 – 40% calcined alumina in the low-plasticity Valencia clay have been investigated after firing at 1100°C. In the Valencia/Cocoloco system, up to 30% of the highly plastic Cocoloco clay may be added to the low-shrinkage Valencia clay without increasing the shrinkage of the Valencia clay by more than 1% while enhancing its strength and toughness. For additions of up to 10% Al₂O₃, the strength and toughness of the Valencia clay are improved by up to 30% and 14% respectively. If however, in both compositional systems, the fired characteristics developed over the range of compositions are controlled by the degree of modification of the clay/non-clay ratio effected by blending.