Development of a Glazed Clay Body Suitable for Cookware


Abstract

Development of a glazed red clay cookware body with adequate thermal shock resistance was successfully done using locally available raw materials. Thermal compatibility of red clay and different fritted glazes were investigated using thermal expansion and thermal shock resistance of individual body/glaze components. Four clay body mixtures were prepared incorporating different proportion of quartz (10%, 20%, 30% and 40%) by dry weight to increase the thermal expansion and tested with glazes. Suitable body and glaze compositions were selected and actual size cookware samples were fabricated and required properties were tested under actual domestic conditions. A kaolinitic red clay body with 25% quartz having a coefficient of thermal expansion $6.31 \times 10^{-7} \text{ K}^{-1}$ and thermal shock resistance 0.97 kJ m$^{-1}$s$^{-1}$ and the glazes having coefficient of thermal expansion in the range of $(49-51) \times 10^{-7} \text{ K}^{-1}$ and thermal shock resistance in the range of $(1.10-1.20) \text{ kJm}^{-1}s^{-1}$ could be effectively used to manufacture a glazed red clay cookware product.