A study on the utilization of coal fly ash derived Grog in clay ceramics

ABSTRACT

Grog is an additive material that plays important roles in ceramic making. It improves the fabrication process of green bodies as well as the physical properties of fired bodies. Few low-cost materials and wastes have found their application as grog in recent years, thus encouraging the replacement of commercial grogs with cost-saving materials. Coal fly ash, a combustion waste produced by coal-fired power plant, has the potential to be converted into grog owing to its small particle sizes and high content of silica and alumina. In this study, grog was derived from coal fly ash and mixed with kaolin clay to produce ceramics. Effects of the grog addition on the resultant ceramics were investigated. It was found that, to a certain extent, the grog addition reduced the firing shrinkage and increased the total porosity of the ceramics. The dimensional stability of the ceramics at a firing temperature of 1200 °C was also not noticeably affected by the grog. However, the grog addition in general had negative effects on the biaxial flexural strength and refractoriness of the ceramics.

Keyword: Grog; Coal fly ash; Clay ceramics; Waste utilization