

Effect of zeolite addition on physical and microstructural properties of porcelain tiles

Zahide Bayer Öztürk¹, Özgür Cengiz^{2*}

¹ Nevsehir Hacı Bektas Veli University, Faculty of Engineering and Architecture, Department of Metallurgical and Materials Science, 50300, Nevsehir/Turkey

² Afyon Kocatepe University, Fine Arts Faculty, Department of Ceramic, ANS Campus, 03200, Afyonkarahisar/Turkey

Abstract

It has been confirmed that the natural zeolite could be replaced gradually or completely feldspathic raw materials of a ceramic tile composition with previously done investigations. In the present study, effects of zeolite substitution for feldspar on the physical and microstructural properties were investigated. Different compositions using natural zeolite (clinoptilolite) from Turkey were prepared to produce a ceramic porcelain tile body. Samples were fired at temperatures from 1180°C to 1230°C (36 min. from cold to cold). The maximum firing temperatures were obtained by means of non-contact optical dilatometer (ODHT). The final physical properties were determined and the analysis of the fired samples was carried out by the X-ray diffraction. The final products were characterized by SEM, EDS. Microstructural analyses of the samples sintered at their maximum density showed differences between compositions, related to the distribution of phases as well as to the grain size of the crystalline phase.

Keywords: Zeolite; Porcelain tile; Microstructural Properties; Physical properties.

*Corresponding Author: ocengiz1@gmail.com; ocengiz@aku.edu.tr; Tel:02722281426-15121;

Fax:02722261308