



Novel technique for the production of mullite glasses from kaolin

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Abstract

Mullite is a widely used material for the production of aluminum refractories. A growing demand of this material by nickel extractive industries in Cuba is limited by null existence of minerals able for the production of Mullite. However, this limitation promotes researches and the development of new materials for this application. In the present work, an experimental novel technique for the production of Mullite glasses starting of nontraditional aluminosilicates, such as, Kaolin is presented. X ray diffraction, thermal and chemical analysis were used for the characterization of both raw and produced materials.

Key words: Mullite, Kaolin, Aluminosilicate, Refractories.

1. Introduction

Mullite is a synthetic material obtaining from different natural aluminosilicates, such as, Kianite, Sillimanite and Andalucite (Liu *et al.*, 1991). Nevertheless, Cuba is one of the countries without exploitable deposits of aluminous minerals, although, it has big deposits of Kaolin. The last mention mineral is a commonly used aluminosilicate by ceramic industries. Literature records related with the use of Kaolin for the production of Mullite is scarce, but, many researchers had carried out different

process with Kianite and Sillimanite getting good results (Sacks and Lee, 1990; Fahenholtz and Smith, 1993). Nowadays, Cuba produces refractory materials of alumina with a high amount of Mullite, however, this material is expensive affecting directly the Cuban extractive industry. Mullite is a mineral that it is very scarce in the nature, since, it requires special conditions of temperature and pressure. But, it is the only stable crystalline phase at high temperatures and normal atmospheric pressure in the SiO₂-Al₂O₃ binary phase equilibrium diagram (Gyepesová and Durovic, 1977). The significance of using Mullite in the refractory products is related with the