Abstract: In order to meet the needs of the local market in terms of renovation of ovens for different uses, we propose the valorization of natural resources through the development of local products that meet industrial requirements and international standards and therefore the reduction of the import bill. Refractory ceramics based on silica-alumina are the subject of our study. The chemical characteristics of kaolin known as DD1, from eastern Algeria were examined. The results showed that kaolin DD1 has an alumina content of 40%, and 37.23% of silica. Thermodifferential and thermogravimetric analysis (ATD and ATG) confirm the mineralogical results obtained by X-ray diffraction (XRD) of the sintered samples at different temperatures namely 1200, 1300, 1350, 1400 and 1450°C; ATD peaks characteristic of a kaolinite are present. X-ray diffraction analysis showed that the refractory samples are composed of mullite and cristobalite. The different treatments lead to the formation of mullite, from 1200 °C the beginning of the crystallization of the mullite and the densification of the sample due to the sintering phenomenon are marked. At sintering temperature greater than or equal to 1200 °C, mullite constitutes the dominant phase of the material. The intensity of the peak at 21.6 °, corresponding to the cristobalite that remains and its intensity increases as the cooking temperature increases, according to the literature at a temperature> 1400 °C cristobalite melts in the amorphous phase which leads to the formation of the vitreous phase which causes the degradation of the refractoriness.

Keywords: Refractory ceramics, silica-alumina, Kaolin, sintering temperature, characterization.