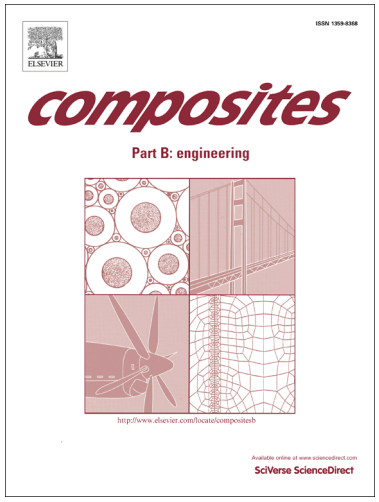

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PHYSICO-CHEMICAL CHARACTERIZATION OF THERMALLY TREATED BENTONITE

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ABSTRACT
Samples of original and thermally treated bentonite at 650°C 4 hours were characterized with chemical analysis,X-ray diffraction,thermal analysis ,mercury porosimetry,differential scanning calorimetry, physisorption measurement and scanning electron microscopy.
These consequence of the heating have been found. The chemical analysis shows high silica and alumina contents and small quantities of Fe^{+3} ,Ca^{+2} and Mg^{+2} .XRD analysis shown the presence the main minerals are montmorillonite and opal CT, in the subordinate quantity illite.The result of the heating was the decomposition of clay minerals. Further , the increase in silica and alumina contents . A significant changes in the original pore structure have been found.The changes were characterized by the expressed increase in the content of total porosity caused by the achieved occurance of the pores covering pore radius area over 2000nm.This effect represents the increased openness of the pore structure which may have the significant role in the intensity of alkali-activation rocess as a factor contributing to the increase of the contact of alkali activator solution with the activated solid. As a possible consequence of the increased openness could be the acceleration of alkali-activation process resulting , for example ,in the accelaration of the strength development of binding system based on the thermally treated bentonite.

Keywords:
A.Material - moulding compounds
B.Property - mechanical properties,porosity
D.Testing - mechanical testing,thermal analysis
E.Manufacturing/ processing - compression moulding

1.Introduction

Bentonite is a clay generated frequently from the alternation of volcanic ash , consisting predominantly of smectite minerals , usually montmorillonite . Bentonite presents strong colloidal properties and its volume increases several times when coming into contant with water ,creating a gelationous and viscous liquid.The special properties of bentonite like hydration , swelling , water adsorption ,viscosity , and thixotropy make it a valuable material for a wide uses and applications.Bentonite , due to its viscosity and plasticity , also is used in Portland cement and mortars. When , also , bentonite pozzolanic activity comes across.
The thermal treatment alters the physical and mechanical properties of clays. When the clayey soils are stabilized with the heat treatment, they can have important permanent properties. Thermally treated clays have been used since ancient times for making soil stabilization and bricks for construction buildings. Heat treatment changes several material characteristics of clayey soils, such as strength, cohesion, consistency limits, optimum water content, maximum dry density, internal friction angle, particle size, permeability and specific