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## **EFFECTS OF ACIDIC AND ALKALINE POLLUTANTS ON THERMAL BEHAVIOUR, MICROSTRUCTURE AND MECHANICAL PROPERTIES OF CLAYS**

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### **Abstract**

Thermal behaviour, microstructure and mechanical properties of the clay polluted by acidic and alkaline pollutants were investigated by thermogravimetric/differential thermal analysis (TG-DTA), scanning electronic microscope (SEM), mercury intrusion experiments, permeability coefficient and unconfined compressive strength tests. The clay polluted by alkaline solution presented distinct exothermic peaks at 304-310°C, while it's not observed for the one polluted by acidic solution due to the decomposition of organics by acid. The porosity, specific surface area and permeability coefficient of the polluted clay increased and unconfined compressive strength decreased with the increase of acidity and alkalinity because of the corrosion of acidic and alkaline solution, and the acidic corrosion was stronger. The mercury ejection curves didn't coincide with the mercury injection curves, which indicated the existence of the residual pores and the ones with the shape of inkbottle. This study clearly demonstrated that the strong acid and alkali accelerated the chemical reaction between chemical solution and clay particles. Furthermore, the release of minerals caused the increase of the development of pores and microstructure change, and lead to the increase of permeability coefficient and the decrease of unconfined compressive strength.

*Key words:* acidic and alkaline solution, clay, microstructure, mechanical properties, thermal behaviour

*Received:* August, 2012; *Revised final:* July, 2013; *Accepted:* August, 2013

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