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Porous ceramic from Moroccan natural phosphate and raw clay for microfiltration applications

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ABSTRACT

Porous ceramics were prepared by the dry compaction process by combining raw clay and Moroccan natural phosphate, which is rich in organic matter. The phosphate was used as a natural pore-forming agent. Compacted pallets were sintered at 1100°C. The samples were characterized by XRD, TG-DTA, Archimedes's principal and Brazilin test. The porosity and the tensile strength were strongly influenced by the concentration of natural phosphate (10–40 wt. %). An increase in the amount of natural phosphate led to an increase the open porosity while the tensile strength was decreased. In order to get porous materials (28 vol% porosity) with a sufficient tensile strength (11 MPa), the optimal clay to natural phosphate mass ratio was found to be 1.5.

Keywords: Clay; Natural phosphate; Porous ceramic; Porosity

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