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Improvement by the use of activated clays

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Macroporous ceramic supports from natural clays. Improvement by the use of activated clays

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Abstract

Porous ceramic supports were elaborated from natural kaolino-illitic clay, before and after acid activation, using uniaxial dry pressing method. The prepared supports were sintered at 850, 900 and 1000°C. The effect of sintering temperature on the mechanical strength, density, porosity, pore size distribution and permeability was evaluated. It was observed that with increase of sintering temperature, the mechanical strength, density and the median pore diameter increase while the porosity decreases. The effect of use of acid activated clay was noticeable; it improved the characteristic of the elaborated supports. In fact, the best mechanical strength was observed with the supports made of pressured acid activated clay, while the highest porosity was obtained with the supports made with clay acid activated under reflux. The best results were for the support made of acid activated clay under reflux sintered at 1000°C with a porosity of 35%, resistance to diametrical compression of 6.6 MPa and median pore size of 0.28 μm . It shown but a permeability of about $0.52 \text{ cm}^3 \cdot \text{s}^{-1} \cdot \text{cm}^{-2} \cdot \text{bar}^{-1}$ at 4.3 bars.

Keywords: A. Sintering, B. porosity, D. Clay, E. membranes.

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