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China, huzijun@hotmail.comTHE EFFECT OF PORE STRUCTURE ON STRENGTH AND THERMAL CONDUCTIVITY OF  
POROUS ZRO2 CERAMICS**Abstract**

Porous YSZ ceramics with various pore structures were fabricated by various TBA-based gelcasting methods, including traditional gelcasting, gelcasting with pore-forming agent, gelcasting with pore-forming agent and fiber-reinforcement. The materials with different pore structures were obtained after sintering on high temperature. The room-temperature compressive strength and thermal conductivity were tested and analyzed. The results showed that although pore size of ceramics with nearly closed pores was larger than that of ceramics with connected pores, the strength of the former was much higher than that of the latter, and the thermal conductivity of the former was a little higher than that of the later, so it is more suitable for application when strength is prior to thermal conductivity. The porosity was increased with the addition of YSZ fiber, and the strength of the materials still remained relatively high in high porosity level. Additionally, cracks in the big samples could be avoided with the addition of fiber with suitable content. The porous YSZ ceramics fabricated by the process above have both high strength and low thermal conductivity, and may be applied in thermal protection/insulation fields.