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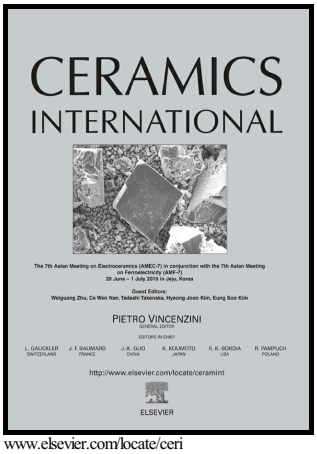

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A non-sintering fabrication method for porous Si_3N_4 ceramics via sol hydrothermal process

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Abstract

A non-sintering fabrication method for porous Si_3N_4 ceramics with high porosity and high mechanical strength was proposed. Strength of the porous ceramics can be obtained by silica sol mass transfer process in hydrothermal conditions rather than a traditionally controlled high temperature sintering process. Under hydrothermal circumstances, silica sol is continuously transfered to the necks of Si_4N_3 powder compact, depositing there and thus consolidating the ceramic skeleton. The key of the method to obtain homogeneous microstructure and mechanical strength is how to keep the silica sol from gelatin during hydrothermal procedure. The stabilization of silica sol and its affecting factors were studied. The results indicated that ultrasonic treatment