

## Liquid Phase Sintered SiC. Processing and some Properties.

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### Autores:

Izhevskiy, V.A. (1); Genova, L.A. (1); Bressiani, J.C. (1)

(1): IPEN - Instituto de Pesquisas Energéticas e Nucleares

(2):

(3):

(4):

**E-mail:** izhevsky@net.ipen.br

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### Resumo:

Regularities of sintering behavior of silicon carbide based materials with AlN and Y<sub>2</sub>O<sub>3</sub> sintering additives were investigated under conditions of pressure-less and gas-pressure sintering in nitrogen and argon. Densification occurred by liquid-phase sintering mechanism. Proportion of alfa- and beta-SiC powders in the initial mixtures was a variable parameter. Transformation-controlled grain growth mechanism similar to the one observed for silicon nitride based ceramics was established. Evolution of microstructure and phase composition were followed up by scanning electron microscopy and x-ray diffraction, respectively. Kinetics of beta to alfa phase transformation during post-sintering heat treatment was studied. Hardness and fracture toughness of both as-sintered and heat treated materials were measured. Possibility of in-situ platelet reinforced dense SiC-based ceramics fabrication with improved mechanical properties by means of sintering was shown. Mechanisms of ceramics toughening are discussed.