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Corrosion of silicon nitride ceramics in aqueous sulfuric acid solution

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Silicon nitride ceramics have excellent mechanical properties and chemical stability, and this way it has been used in several components exposed in severe corrosive environments. However its corrosion resistance in acid environment strongly depends on the amount and chemical composition of the grain-boundary. In this work the corrosion behavior of Si₃N₄ with different amounts of sintering aids (3 and 7mol% of 3La₂O₃-5Al₂O₃), in 1 N sulfuric acid was studied. The experiments were accomplished in the room temperature, 50 °C and 80 °C, being possible to evaluate the effect of the temperature in the corrosion. The results shows a significant dependence of the corrosion resistance related to studied parameters.