it is used not only in the metallic aluminum manufacture, but also in the production of refractory materials. For this purpose, the "in natura" bauxite must satisfy composition specifications sufficiently rigid: the minimum content of aluminum oxide must be 59% and Fe2O3, SiO2 and TiO2 cannot exceed 2.0; 5.5 and 2.5% respectively1.
The state of Santa Catarina withholds significant reserve of this ore, being it of the gibbsitic type. The X-ray Diffraction (XRD) proved the great presence of gibbsite (Al(OH)3) in the material, followed of goethite (FeO(OH)) and boehmite (AlO(OH)). The Chemical Analysis of the same one demonstrated that the iron content is 7.5% and the others components don't exceeded their limits. Then it's necessary a refined chemical treatment for the iron dissolution.
The reduction of the high iron content was realized using Hydrochloric Acid with the evaluation of the following parameters: acid concentration, stirring speed in reactor and particles size of bauxite. The temperature during the reactions was fixed in 75°C and had printed diverse curves of dissolved iron percentage versus time. The effect of concentration variation was evaluated using the values of 3, 4 and 5 M. The values of stirring speed had been of 300, 600 and 900 rpm. And the particles size had varied between 53-106 μm, 106-250 μm and 250-500μm. In such a way, the influence of the variation of each parameter in the leach could be evaluated, as well an estimation of a possible controlling mechanism of the reaction. Using the concentration of Hydrochloric acid 5 M, the iron oxide content was below of 0,5% after 90 minutes of reaction representing more than 90% of dissolution, proving the viability of the process. After the chemical treatment, the bauxite is apt to the calcination stage and posterior use as raw material in the manufacture of refractory.

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Production of porous beta-Si3N4 from aqueous foams using ovalbumin as gelling and foaming agent

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High performance porous silicon nitride ceramics have received considerable interest in the past five years due their wide range of current and potential technological applications. These ceramics are lightweight structural materials that exhibit high strength and toughness, with low elastic modulus, low thermal expansion coefficient with a consequent excellent thermal shock resistance. Foams of silicon nitride were produced by vigorous agitation of slurries, using ovalbumin as foaming and gelling agent. Samples with different characteristics related to porosity (density, pore size distribution and mean size, permeability, etc.) were obtained. These samples were characterized through density (Archimedes method), porosity (mercury intrusion), microstructure (SEM) and mechanical strength. The results indicates a relationship of the porosity (and its characteristics) and mechanical properties with the processing variables.

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Characterization of porous beta-Si3N4 ceramics obtained with addition of corn starch

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Developments of porous beta-Si3N4 ceramics with similar mechanical characteristics to dense beta-Si3N4 are subject of many studies in recent years. The addition of sacrificial phase, specific sintering aids and pressureless sintering at low temperature and/or time are used to obtain highly porous samples. In this study were obtained Si3N4 samples with different characteristics related to the porosity (quantity, size distribution, mean size) using different amount of corn starch as sacrificial phase, La2O3 as sintering aid with variations in sintering profile,. The obtained samples were characterized through porosity