(P03)

Corrosion behaviour of low cost SiAlON ceramics

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ABSTRACT

Low cost SiAlON ceramics were produced from rather coarse (d50: 2μm), impure and economical β-Si_3N_4 and α-Si_3N_4 powders via gas pressure sintering method. The corrosion behaviour of gas pressure sintered low cost SiAlON ceramics was evaluated with two different methods. In the first experiment the samples was subjected to acidic and basic aqueous solutions (HCl, H_2SO_4, Citric Acid and NaOH) at 80°C for 300 hr. In the second study, the static salt corrosion test was conducted at 1100°C, for 14 days under flowing ultrahigh purity argon gas. The corrosion resistance of low cost SiAlONs were compared with commercial Si_3N_4 and SiAlON ceramics. The progress of corrosion was investigated in terms of mass loss and thickness of the corroded layer. The factors affecting the progression of the corrosive attack will be presented and potential of low cost SiAlONs in corrosive environment will be discussed.

(P07)

Investigation of micostructure and mechanical properties of SiAlON ceramics with TiN additive

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ABSTRACT

The amount of TiN reinforcement phase is one of the most effective parameter on microstructure and mechanical properties of SiAlON ceramics. Up to now limited studies have been conducted on SiAlONs to investigate the role of TiN content. In this study, 25α':75β' SiAlON compositions were designed with different content of TiN additive (0-25 wt.%) by using Er:Sm:Ca cation system. The samples were densified by gas pressure sintering method. XRD and SEM characterisation techniques were used to observe the effect of TiN additive content on phase and microstructural evolution, respectively. Vickers hardness and fracture toughness of the representative samples were measured. Relationship between TiN content and hardness, fracture toughness, microstructure, phase evolution will be presented and optimum content of TiN for α/β SiAlON ceramics will be discussed.

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