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[54] **REACTION INHIBITED-SILICON CARBIDE FIBER REINFORCED HIGH TEMPERATURE GLASS-CERAMIC COMPOSITES**

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[58] **Field of Search** 501/88, 89, 95, 32, 501/4, 5, 7; 428/114, 367, 398, 428, 432, 698, 902

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[57] **ABSTRACT**

A silicon carbide fiber reinforced glass-ceramic matrix composite is disclosed having high strength, fracture toughness, and improved oxidative stability even at high temperature use, e.g., in excess of 1000° C. The composite is made up of a plurality of glass-ceramic layers, each layer reinforced with a plurality of unidirectional continuous length silicon carbide or discontinuous SiC fibers. The composite is formed by starting with the matrix material (preferably lithium aluminosilicate) in the glassy state and converting it from the glassy state to the crystalline state after densification of the composite. Ta or Nb compounds are added to the matrix composition prior to consolidation to form a reaction or diffusion barrier around the SiC fiber, resulting in composites with high temperature oxidation stability. Substitution of at least part of the Li_2O in the matrix with MgO results in an even higher temperature stable composite, e.g., up to about 1200° C.

2 Claims, 1 Drawing Figure