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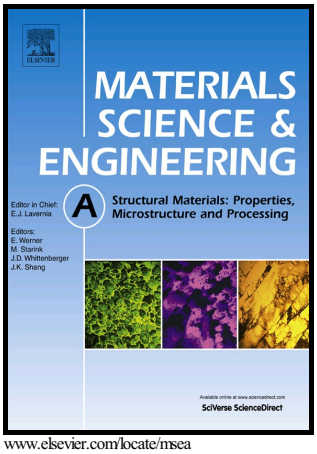

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Thermal shock resistance of continuous carbon fiber reinforced ZrC based ultra-high temperature ceramic composites prepared via Zr-Si alloyed melt infiltration

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Abstract: Thermal shock resistance of continuous carbon fiber reinforced ZrC based ultra-high temperature ceramic matrix composite (C/C-ZrC) from ultra high temperatures (particularly >1500^{o}C) to the room temperature was evaluated using a novel self-developed equipment with high heating-cooling rates in controllable atmosphere. Residual strength and mass variation of the as-prepared composite under different thermal shock cycles and temperatures were tested to characterize the thermal shock resistance. Flexural strength of the composite slightly decreases initially without obvious weight loss below 1300^{o}C, while it decreases by relatively high values at 1300-1900 ^{o}C and then sharply decreases over 1900^{o}C with obvious increase of weight loss. Microstructure of the thermally shocked specimens was examined to reveal the thermal shock damage. Matrix cracking, interfacial debonding and matrix pores were clearly observed, which were the main reasons for the strength

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