

Thermal shock of Al₂O₃-SiC ceramic material obtained by replication method

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Abstract:

Polymeric sponge replication technique is the most used process to obtain ceramic foams with a cellular structure for filtration applications. The most used route to produce a closed-cell structure for filter applications is the replication of polymer foam by application of ceramic slurry [1-3]. This method consists in the impregnation of polymeric foam with ceramic slurry followed by a heating treatment that will burn out the organic elements and sintering the material, resulting of a replication of the original foam. Morphology, size of the cell and the degree of interconnectedness, permeability and mechanical properties at room and high temperatures are important parameters that influence significantly the application of these materials. In this work X-ray diffraction, scanning electron microscopy and thermal shock have been investigated for a cellular ceramic material with 10 and 40 ppi (pores per linear inch). The results obtained in this work indicated that the cellular ceramic materials with 20 ppi present a more pronounced decrease of the thermal resistance.

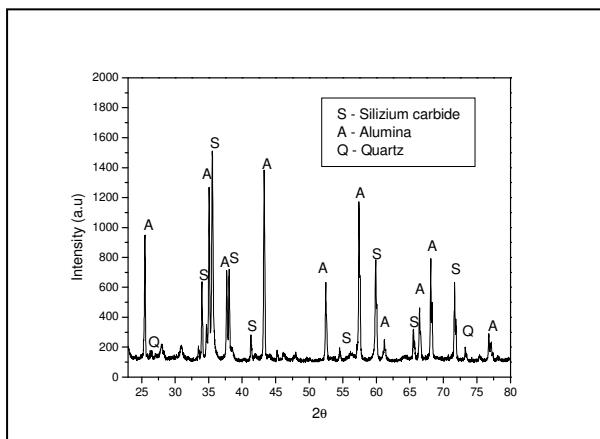


Figure 1: X-ray diffraction pattern.

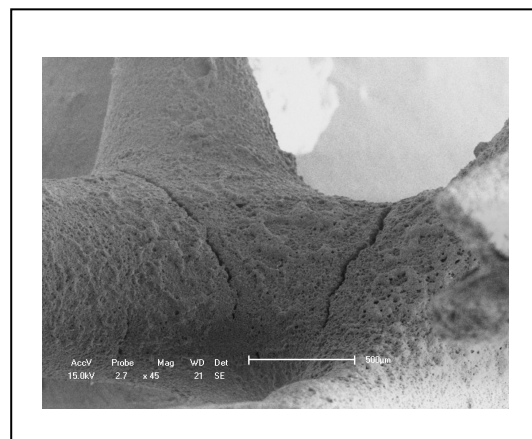


Figure 2: Fracture surface after thermal shock..

References

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