Manufacturing of Silicon Carbide Foam by Replica Technique

Ceramic foams, which are manufactured by the popular replica technique using various ceramic powders such as ZrO₂, Al₂O₃, SiC, Spinel, etc., are widely used as molten metal filters, hot gas filters, gas burner, gas mixer/distributor working under severe conditions. Thanks to the high porosity in the range of 70 - 95% which inherits from polyurethane(PU) sponges, these ceramic foams possess excellent permeability of gases and fluids. SiC foam is one of the most interesting products due to its outstanding properties such as high temperature resistance, excellent chemical properties --- inert both to acids and alkalis, high thermal conductivity and high thermal shock resistance. The aim of this work is to manufacture SiC foam by the replica technique with improved mechanical properties.

Your Tasks:
- Slurry preparation and characterization
- Impregnation
- Removing binder/dispersant/stablizer and PU sponge material at low temperatures
- Sintering at high temperatures
- Evaluation of the SiC foam (Microstructure, porosity, mechanical property…)

Your Focuses:
- Optimization of slurry properties for impregnation
- Optimization of sintering additives and sintering process
- Improvement of mechanical property

Begin: From now (08.11.2010) or by agreement

Duration: Flexible, depending on the types of your work

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