

"Basic Science in Injection Molding of Ceramics"

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ABSTRACT

Basic studies were carried out on the Injection Molding, together with Sintering for silicon carbides.

Compounding of SiC powders in polymer melts was discussed on the basis of dependences of mixing torque on the duration time. The effects of solid concentration, surface area of SiC powders, as well as the effects of amounts of plasticizer, on the mixing torque were studied.

Rheological measurements were made for both polymer melts and those filled with SiC powders with different amounts of plasticizer. The differences in the rheological properties between filled and unfilled systems were discussed.

Filling patterns of the mixtures into the cavity were evaluated by means of short shots by use of test piece dies. The changes in cavity pressure were measured for the SiC-polymer mixes with different concentrations.

The effect of SiC loading (green density) on the linear shrinkage during sintering was discussed.

Finally, flexural strength measurements were made for the sintered SiC fabricated through Injection Molding Process with different SiC loadings.