

## ABSTRACT

SiC is an important engineering material used for high temperature structural applications specially in aerospace and nuclear reactors. Unfortunately the low ductility of SiC, which restricts its applications, can be improved by producing full or nearly full density product.

SiC, being a covalent compound, requires very high temperature for sintering (2100 to 2250°C) and also tends to decompose at higher temperature. Mainly two routes are available for the sintering of SiC at lower temperature: through reduction of particle size or through the liquid phase sintering. Very little data is available regarding the sintering. In this work an attempt is made to optimize the process parameters of sintering of coarse SiC powder with suitable additives. Detailed studies have been carried out to suggest the process of sintering, mainly microstructure, crystal structure and polytypes. 98% theoretical density product can be achieved by the use of about 3.17  $\mu\text{m}$  size starting powders.

**KEY WORDS :** Silicon carbide (SiC),  $\alpha$ -SiC,  $\beta$ -SiC, Powder, Sintering, Density, Microstructure, Polytypes, Polytypism, Temperature, Pressure, Morphology, Sintering Additives.