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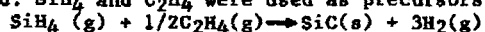
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## SILICON CARBIDE CHEMICAL VAPOUR INFILTRATION

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The kinetics of a SiC chemical vapour deposition and infiltration process were studied. SiH<sub>4</sub> and C<sub>2</sub>H<sub>4</sub> were used as precursors:



The composition and microstructure of the resulting coatings were investigated. Furthermore the deposition rate on the surface as well as in pores of the substrate were studied.

To this end, graphite substrates were used that were provided with model pores: cylindrical holes 200-1000 μm in diameter. The thickness profile of the SiC coating on the pore wall was measured using Scanning Electron Microscopy. The dependency of this profile on the various process parameters like: temperature, total pressure, gas composition and flow rate was studied. The results obtained in the present investigation were compared to those obtained by other investigators (Fitzer, van den Brekel, Rossignol) and their respective chemical vapour infiltration models.

Apart from this fundamental approach to the CVI process, a CVI apparatus is being developed for manufacturing ceramic/ceramic composites. Fibrous preforms of either graphite or silicon carbide will be densified in this apparatus by CVI. The main goal of the present project is to produce dense ceramic composites in this apparatus using CVI in a combined temperature and pressure gradient across the fibrous preform.

The resulting C/SiC and SiC/SiC composites will be characterized in terms of their microstructure and porosity, with special attention being given to the fibre-matrix interface. Furthermore high temperature mechanical and corrosion properties will be determined in various atmospheres.