

## STUDY OF THE PYROLYSIS MECHANISM OF SIBCN POLYMER PRECURSOR

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The pyrolysis mechanisms occurring during the conversion of polyborosilazane (PBSZ) into amorphous SiBCN ceramic have been investigated. TGA–TDG experiment have been applied to investigate the mass loss behaviour during ceramization. Solid-state  $^{11}\text{B}$ ,  $^{13}\text{C}$  and  $^{29}\text{Si}$  NMR spectroscopy has been applied to probe the local environment of all NMR active nuclei in the precursor, the thermolysis intermediates and the ceramic residue. IR spectroscopy has been performed to receive valuable information on the chemical bonding in all materials. At temperature below 400°C, Si-N bonds are formed via condensation reaction involving N-H and Si-H units with hydrogen released. It is followed by evolution of hydrocarbons due to the cleavage of bonds and formation of methane and hydrogen at 600 °C. After heating to 1000 °C, ceramization complete and free carbon,  $\text{BN}_3$  domains as well as Si–C–N units coexist  $\text{SiC}_x\text{N}_{4-x}$ ,  $x=0,1,2,3$ . And  $\text{BN}_3$  keep unchanged during the whole ceramization stage.