

Formation of SiC Rods in Composites of SiC/SiO₂/C from carbonized wood infiltrated with ethylsilicate-40

Abstract

Silicon carbide rods were formed in composites of silicon carbide/silicon dioxide/carbon (SiC/SiO₂/C) from carbonized wood impregnated with ethyl silicate-40 after heat treatments using a pulse current apparatus. The effect of reaction temperatures, heating rates and pressures on the SiC rods formation was investigated. Raman spectroscopy indicated that the SiC rods possessed well crystalline. The SiC rods in the composites prepared at 1200 and 1400°C exhibited straight structure with smooth surfaces. The increase of reaction temperature up to 1600°C increased the length and diameter of SiC rods which exhibited a camelback-type structure. Different heating rate only determined the length of SiC rods grown; meanwhile the increase of pressure from 0 to 15 MPa increased the length and diameter of SiC rods grown.