

### 论文摘要

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## B、Si改性炭/炭复合材料及其摩擦磨损特性

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**摘要:** 以低密度的C/C复合坯体为预制体, 分别采用反应熔渗(RMI)、化学气相沉积(CVD)、浸渍-原位反应技术对其进行陶瓷改性。结果表明: 改性陶瓷分别以SiC和c-BN的形式渗入C/C复合坯体内。摩擦试验结果表明: 采用RMI技术制备的C/C-SiC复合材料摩擦因数较高, 高达0.3到0.9; 采用CVD技术制备的C/C-SiC复合材料的摩擦因数在0.20-0.36之间; 而采用浸渍-原位反应技术制备的c-BN改性C/C复合材料的摩擦因数较低, 为0.10-0.20。SEM观察表明: 采用RMI技术制备的C/C复合材料的摩擦表面粗糙、未形成完整的摩擦膜, 而采用另两种技术制备的C/C复合材料均形成了较完整、致密的摩擦膜。

**关键字:** C/C复合坯体; 碳化硅; 氮化硼; 摩擦磨损

## **C/C composites modified by B, Si and their friction and wear properties**

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**Abstract:** The low density C/C composites were modified by B and Si using reaction melt infiltration (RMI), chemical vapour deposition (CVD) and impregnation and in-situ reaction. The results show that the modified ceramics are successfully added in the matrix carbon as SiC or c-BN. The C/C-SiC modified by RMI has high friction coefficient which reaches 0.30-0.90. The friction coefficient of C/C-SiC modified by CVD changes in 0.20-0.36, while the composites modified by c-BN using impregnation and in-situ reaction hold the lowest friction coefficient, which is 0.10-0.20. The wear surfaces of the RMI-modified composites are very rough without any integrated friction film, while the wear surfaces of the other two composites are compacted and integrated.

**Key words:** C/C composites; SiC; boron nitride; friction and wear

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