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碳 / 碳复合材料表面沉积SiC的形态和成分

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MORPHOLOGY AND INGREDIENT OF SiC COATING ON C/C COMPOSITES

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摘要

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摘要 在PAN碳布和沥青基体碳的C/C复合材料表面涂覆了SiC。用CH₄和N₂为载气的SiCl₄作原料,用H₂为稀释气,在两种气体混合比和三种温度下化学气相沉积SiC涂层。分析表明,涂层的主要元素有C、Si、Cl和微量Ca。电镜观察表明,涂层中C原子含量为62%时呈菜花状或云团状,而当C/Si比接近于1时,表面呈菠萝状。

关键词: 碳化硅 涂层 碳-碳复合材料 成分 形态学

Abstract: SiC was coated on the surface of Carbon-Carbon composites prepared from the PAN carbon-cloth and pitch. CH₄ and SiCl₄ are used as raw material, N₂ as carrying gas for SiCl₄ and H₂ as dilution gas. CVD SiC coating is prepared with two kinds of ratio and three kinds of temperature. The main elements of coating are C, Si, Cl and trace Ca from electronic probe, SEM observation revealed that, when the C content is 62%, the morphology of SiC appearance is cauliflower or in cloud mass with poor oxidation resistance, and while C/Si ratio tends to 1, the surface morphology is pineapple with increased oxidation resistance. In addition, when the deposited temperature increases, the size of surface pellet becomes larger.

Keywords: silicon carbides coatings carbon-carbon composites composition morphology

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