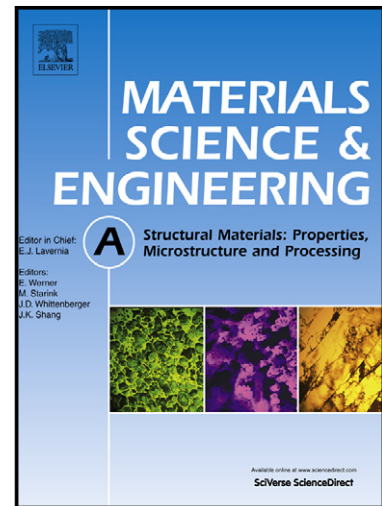


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Active brazing of carbon fiber reinforced SiC composite and 304 stainless steel with Ti-Zr-Be

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Abstract: Carbon fiber reinforced SiC (C_f/SiC) was successfully joined to 304 stainless steel with Ti-Zr-Be filler metal by vacuum brazing. The interfacial microstructure was investigated by scanning electron microscope (SEM), energy dispersive spectrometer (EDS), auger electron energy spectroscopy (AES) and X-diffraction (XRD). The mechanical properties of the brazed joints were measured by a mechanical testing machine. The results show that Ti and Zr elements in the interlayer can react with the brazed materials, the brazed joint mainly consists of Ti_5Si_3 , TiSi, TiBe, TiFe and Zr(s,s) reaction products. The 304 stainless steel constantly dissolved and Ti, Be diffused into 304 stainless steel, which formed the diffusion layers between interlayer and 304 stainless steel. Ti and Be element have an effect on promoting the formation of α -Fe layer. The maximum shear strength of 109.13 ± 2.55 MPa is obtained at 950°C with 60 min holding time.

Keywords: C_f/SiC composite; 304 stainless steel; Brazing; Ti-Zr-Be foil

1. Introduction

In recent years, carbon fiber reinforced SiC (C_f/SiC) ceramic matrix composites have

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