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PRODUCTION AND CHARACTERIZATION OF SELF-HEALING PROPERTIES OF B4C+SiC ADDED TBCFatih Üstel¹, Ahmet TÜRK², Garip Erdoğan³

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Thermal barrier coatings have significant interest for protecting of the effect of high temperature the materials used under high temperature. To coat the materials used under high temperature such as gas turbine liners, is considerably important. Yttrium stabilized zirconia (YSZ) is the most common material used for that purposes in commercial applications. Thermal barrier coatings damage due to the thermal expansion and internal stress, formed by the temperature variation. The micro and macro cracks, which are formed under service life of the coating, causes the coating failures such as spallation by developing crack network. In this research SiC and B4C powders added into commercial YSZ powder to improve thermal shock resistance. Two different powder ratio were prepared as %25(%12,5 SiC +B4C) %75 YSZ and %50(%25 SiC +B4C) %50 YSZ. After preparing powders coatings were manufactured using F4 plasma gun. Coated samples were subjected to thermal shock test in burner rig testing equipment and also oxidation tests were carried out as well for 10h, 20h and 50h at 1000°C. TG and XRD analysis were used to investigate self-healing products. Scanning Electron Microscope and Optical Microscope were used to examine microstructural properties of SiC and B4C added YSZ.

Keywords

Self Healing

plasma spray

Thermal Barrier Coatings

B4C+SiC

Oxidation