عنوان مقاله:

Study of the production possibility of thermal barrier coatings stabilized on the inconel ۷۳۸LC zirconia supper alloy with electrophoretic deposition method

محل انتشار:

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خلاصه مقاله:

Zirconia coatings stabilized with ytteria are among heat barrier coatings and are used in airspace industry and gas turbines widely. Stability in high temperature working condition of these coatings has been always considered by researchers. In this work, application of zirconia coatings stabilized with ۸% wt. ytteria using electrophoretic deposition method in a solution containing acetone and ethanol (۳:۱) on the Inconel ۷۳۸ LC alloy substrate was investigated. In the present work, The applied dc voltage was varied from ۱۰ to ۸۰V.cm–۱ and also the deposition time was varied ۱-۵ min. Crack-free green ۸YSZ film deposited on IN۷۳۸LC substrates were dried at room temperature for ۱ day. The ۸YSZ deposits were viewed under a metallurgical microscope to determine the presence of cracks or other defects in the as deposited coatings after initial drying. The polished cross-sections of the porous specimens were observed in an optical microscope (OM) and and the surface morphology was characterized using a scanning electron microscope (SEM). The results showed that the effect of applied dc voltage during EPD on the weight of the deposit and in turn on the thickness of the coating obtained was studied. the increase in voltage results in increase of coating rate and consequently the increase of the coating thickness in a definite time. Furthermore, in the constant applied voltage, as the time goes on, the thickness of the coating increases but ultimately the rate of the thickness increase decreases. In optimized condition, the developed coatings in the average applied voltage (۲۵-۴۵), have more uniform surface morphology and thickness than other applied voltage.

کلمات کلیدی:

۸YSZ (۸% Yttria Stabilized Zirconia), thermal barrier coating, EPD, IN۷۳۸LC.