

## عنوان مقاله:

EFFECT OF RELATIVE HUMIDITY, HEATING RATE AND FILM THICKNESS ON THE CRACKING ONSET TEMPERATURES IN ZRCONA SOL GEL THINFILMS DERIVED ON 316L SS SUBSTRATE

## محل انتشار:

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## خلاصه مقاله:

In this research, a sol-gel dip coating process has been used to derive zirconia ( $ZrO_2$ ) nanostructured thin films on 316L stainless steel substrate, using zirconium acetate hydroxide as precursor. Microstructural features and phase crystallization of the synthesized thin films were characterized by Fourier transform-infrared spectroscopy (FT-IR), X-ray diffractometry (XRD) and scanning electron microscopy (SEM). FTIR in corroboration with X-ray studies confirm the crystallization of tetragonal (t- $ZrO_2$ ) and monoclinic (m- $ZrO_2$ ) zirconia phase at 700 °C and 900 °C temperatures, respectively. SEM studies showed that the cracking onset temperature decreased with increasing relative humidity and film thickness, while it increased with heating rate until 5 °C/min and then decreased. Electrochemical investigations on these parameters demonstrated that the 3-layered coatings in 25% relative humidity with a heating rate of 5°C/min had the strongest corrosion barrier performance on the 316L stainless steel.

## کلمات کلیدی:

Sol-gel,  $ZrO$ , thin films, 316L SS, humidity, corrosion behaviour

## لینک ثابت مقاله در پایگاه سیویلیکا:

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