

Microstructural characterization of ZrO_2 layer coating on martensitic stainless steel

Abstract

High carbon steel stainless steel such as 440C martensitic stainless steel, are commonly used for automotive components, such as ball bearings, races, gage blocks and valve. In this study, 440C steel was coated with ZrO_2 by electrolytic deposition in $ZrO(NO_3)_2$ aqueous solution. After annealing, the ZrO_2 coated specimens were characterized by x-ray diffraction (XRD) and scanning electron microscope (SEM). Scanning electron micrograph showed that thickness of the coated sample was approximately $0.7\mu m$. Besides that, secondary hardening effect occurred on the annealed SS440C substrate and it might be due to the presence of secondary carbide.