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Effet de Silicium sur les propriétés de Ti déposé par évaporation thermique sous vide

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Abstract : In this work, structural, morphological, and mechanical properties of Ti-Si thin films grown by Vacuum Thermal Evaporation were investigated. A series of Ti-Si coatings have been deposited by vacuum thermal evaporation technique, on Z200 steel and Si (100) substrates. 180 mg of titanium powder and 4at.%, 7at.%, 11at.%, 17 at.% of Silicon grains were used as deposition source. X-ray diffraction, Scanning Electronic Microscopy were employed for structural and morphological study of the films, nano-indentation hardness testing test was used to evaluate the mechanical properties, the corrosion behaviors of the coatings were studied in aerated 3.5 wt. % NaCl aqueous solutions by interpretation of the electrochemical anodic polarization curves. The X-Ray Diffraction patterns reveal that all films are polycrystalline and matched those of α -Ti, Ti_5Si_3 , Ti-Si, and Ti_4Si , the hardness and the Young's Modulus increase firstly to achieve a maximum value 33 GPa, and 795 GPa then decrease smoothly with a further addition of Si to a weak value

Keywords : Ti-Si, Vacuum Thermal Evaporation