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Structural Properties of High Speed Electrodeposited Ni-Co Alloy Film on Titanium. KAN XIE, Michigan State Univ, MOHAMMAD SAKHAWAT HUSSAIN, Birmingham City Univ, VIRGINIA AYRES, Michigan State Univ — A new and innovative high-speed process for direct electrodeposition of Ni-Co alloy on titanium surfaces without any pretreatment or displacement reaction has recently been reported [1]. Investigations of the non-columnar growth mechanism(s) that result in high-speed adhesive coating formation are presented. Our results indicate that deposition of nanocrystalline nickel throughout the entire film growth process plays a critical role. When present, local nanowire formation is interpreted in terms of super-saturated conditions. Titanium is a metal that finds use in a wide variety of applications as a structural material in aircrafts, engines, missiles, bicycles and load-bearing bone prostheses. Conventional pretreatment methods to remove a thin tenacious oxide layer and then cap the surface with a sacrificial layer are dangerous, time-consuming and environmentally unfriendly. Extensions of the new high speed method to additional thin film systems are considered. [1] Hussain, MS. Direct Ni-Co alloy plating of titanium alloy surfaces by high speed electrodeposition. Trans Inst of Metal Finishing 90 (2012) 15. doi: 10.1179/174591911X13188464808876

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