鎳鎢磷合金電鍍層之腐蝕磨耗行為研究

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摘 要

本研究利用梢與環(block-on-ring)腐蝕系統研究電鍍鎳鎢磷合金鍍層在5%NaCl溶液中之腐蝕與磨耗行為，探討在不同極化電位下對鍍層表面結構組織、重量損失量及摩擦係數的影響，並建構腐蝕磨耗定量分析。 在腐蝕試驗方面，隨極化電位增加，鍍層表面形貌從無腐蝕跡象轉變為細小蝕孔。最後，孔蝕相繼連結形成較大的孔蝕且產生裂紋，其重量損失量及表面粗糙度隨之增加。 在腐蝕磨耗試驗方面，在低極化電位下，鍍層表面僅受到磨耗痕跡而無腐蝕跡象。隨極化電位提升，鍍層表面磨耗面積增加，相對摩擦係數值也隨之增加。在高極化電位下，鍍層表面除了磨耗痕跡外，還有鍍層表面產生孔蝕，最後孔蝕面積越大，深度加深且形成裂紋。鍍層孔蝕提供了溶液滯留於表面，滯留的溶液提供負載支撐和減少鍍層的接觸於磨耗。因此，摩擦係數隨極化電位上升而下降。 最後，透過腐蝕磨耗定量分析，在低極化電位下鍍層具有耐腐蝕磨耗能力。在高極化電位下，腐蝕磨耗交互作用是造成鍍層嚴重破損之主要因素。發現磨耗分量會持續增加，腐蝕分量則變化不大。

關鍵詞 : 電鍍鎳鎢磷合金、磨耗、腐蝕、腐蝕與磨耗

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