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PENYADURAN NIKEL TANPA ELEKTRIK KE ATAS PLASTIK ABS MENGGUNAKAN KAEDAH SALUTAN POLIMER

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Abstrak: *Dalam kajian ini, penyaduran nikel tanpa elektrik dijalankan ke atas plastik akrilonitril-butadiena-stirena (ABS) menggunakan kaedah salutan polimer. Substrat ABS terlebih dahulu disalut dengan polimer sebelum penyaduran dilakukan. Polimer yang digunakan ialah poliuretana. Berdasarkan keputusan awal yang diperoleh, masa rendaman yang optimum di dalam larutan pemekaan ialah 1 jam. Manakala nilai pH rendaman nikel yang optimum ialah pH 7.5 - 8.0. Analisis kekerasan Vickers, analisis mikroskop penskanan elektron (SEM) dan analisis penyerakan tenaga sinar-X (EDX) telah dijalankan ke atas hasil saduran. Keputusan analisis yang diperoleh dibandingkan dengan keputusan analisis bagi kaedah konvensional. Keputusan kekerasan Vickers menunjukkan nilai kekerasan saduran nikel (HV) bagi kedua-dua kaedah ini adalah setanding. Berdasarkan keputusan analisis SEM, didapati morfologi saduran nikel bagi kedua-dua kaedah ini agak berbeza. Bagi kaedah konvensional, hasil penyadurannya kelihatan merekah tetapi agak rata dan seragam. Manakala bagi kaedah salutan polimer, hasil penyadurannya tidak rata dan kasar tetapi tiada rekahan dilihat. Keputusan analisis EDX pula menunjukkan kaedah konvensional menghasilkan saduran logam yang mempunyai peratusan kandungan fosforus yang lebih tinggi daripada kaedah salutan polimer.*

Kata kunci: penyaduran nikel tanpa elektrik, akrilonitril-butadiena-stirena, kaedah salutan polimer, kaedah konvensional, poliuretana.

Abstract: *In this study, electroless nickel plating was employed on an acrylonitrile-butadiene-styrene (ABS) plastic using a polymer coating technique. The ABS substrate was coated with a polymer before plating could take place. The polymer that was used is polyurethane. From preliminary results obtained, the optimum immersion time in an activation solution and the optimum pH value for a nickel bath is 1 hour and 7.5 - 8.0 respectively. Vickers hardness, scanning electron microscope (SEM) and energy dispensive X-ray microanalysis system (EDX) analyses were performed on the metalized product. The results were compared against the conventional electroless plating technique. The hardness of the nickel coatings for these two methods is comparable. From the SEM results, the conventional method gave a uniform and smooth nickel coating but there are some cracks observed on the coating. On the other hand, the surface structure for the polymer coating is rough and coarse but no crack was detected. The EDX results showed that the conventional method produces a metal plating which has more percentage of phosphorus compared to the polymer coating method.*

Keyword: electroless nickel plating, acrylonitrile-butadiene-styrene, polymer coating method, conventional method, polyurethane.