

ABSTRAK

Seiring dengan perkembangan teknologi, keperluan akan barang dan komponen yang terbuat dari logam saat ini semakin meningkat. Untuk meningkatkan kekerasan dan ketahanan logam dari korosi serta mendapatkan nilai dekoratif maka diperlukan proses pelapisan yang salah satunya adalah proses elektroplating. Pada penelitian ini, material yang akan dilakukan elektroplating yaitu baja JIS G3131 SPHC sebagai katoda dan logam nikel sebagai anoda. Proses elektroplating dilakukan pada suhu 50-70°C, jarak anoda dan katoda sebesar 7 cm dan larutan nikel Watt's sebagai elektrolitnya. Penelitian ini menggunakan variabel kuat arus 3A, 4A, dan 5A serta variasi konsentrasi larutan nikel Watt's. Penelitian ini bertujuan untuk mengetahui pengaruh variasi kuat arus dan konsentrasi larutan watt's nikel terhadap ketebalan, kekerasan, efisiensi kuat arus, dan permukaan lapisan nikel pada spesimen baja JIS G3131 SPHC. Hasil yang didapatkan yaitu semakin besar variasi kuat arus dan konsentrasi larutan meningkatkan kecerahan lapisan nikel, nilai ketebalan, kekerasan, serta efisiensi kuat arus yang dihasilkan. Hasil kecerahan, ketebalan, kekerasan, dan efisiensi kuat arus tertinggi didapatkan pada spesimen I dengan kuat arus 5A dan konsentrasi larutan Watt's 3 (NiSO₄ 350g/l, NiCl 50g/l, dan H₃BO₃ 30g/l) dengan nilai ketebalan 0,0177 mm, kekerasan 505,619 VHN, dan efisiensi kuat arus 116,1%. Selain variasi kuat arus dan konsentrasi larutan nikel Watt's, pengaruh kebersihan permukaan spesimen, kebersihan larutan elektrolit serta nilai tegangan mempengaruhi hasil dari elektroplating nikel.

Kata kunci : Elektroplating Nikel, Kuat Arus, Konsentrasi Larutan, Kekerasan, Ketebalan,

ABSTRACT

Along with the development of technology, the need for goods and components made of metal is currently increasing. To increase the hardness and resistance of metals from corrosion and to obtain decorative values, a coating process is required, one of which is the electroplating process. In this study, the material to be electroplated was JIS G3131 SPHC steel as the cathode and nickel metal as the anode. The electroplating process was carried out at a temperature of 50-70°C, an anode and cathode distance of 7 cm and a Watt's nickel solution as the electrolyte. This study uses current strength variables 3A, 4A, and 5A and variations in the concentration of Watt's nickel solution. This study aims to determine the effect of variations in current strength and concentration of nickel watt's solution on thickness, hardness, current strength efficiency, and surface nickel coating on JIS G3131 SPHC steel specimens. The results obtained are that the greater the variation in current strength and concentration of the solution increases the brightness of the nickel layer, the value of thickness, hardness, and the efficiency of the resulting current strength. The results of the highest brightness, thickness, hardness, and current efficiency were found in specimen I with a current strength of 5A and a solution concentration of Watt's 3 (NiSO₄ 350g/l, NiCl 50g/l, and H₃BO₃ 30g/l) with a thickness value of 0.0177 mm, hardness of 505.619 VHN, and strong current efficiency of 116.1%. In addition to variations in current strength and concentration of Watt's nickel solution, the influence of the cleanliness of the specimen surface, the cleanliness of the electrolyte solution and the voltage value affect the results of nickel electroplating.

Keywords: *Nickel Electroplating, Current Strength, Solution Concentration, Hardness, Thickness,*