ABSTRAK

ALAT MONITORING ARUS DAN TEGANGAN OTOMATIS PADA PROSES ELEKTRODEPOSISI NIKEL DENGAN DETEKSI GAS H_2 DAN PERHITUNGAN MASSA NIKEL MENGGUNAKAN HUKUM FARADAY

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Penelitian ini membahas perancangan sistem pemantauan arus dan tegangan otomatis pada proses elektrodeposisi nikel dengan deteksi gas H_2 serta perhitungan massa nikel menggunakan Hukum Faraday. Tujuan penelitian adalah merancang alat monitoring berbasis sensor INA219 dan MQ-8 yang terintegrasi dengan mikrokontroler untuk mencatat data secara real-time, serta menganalisis hubungan antara variasi arus, waktu proses, dan pelepasan gas hidrogen terhadap hasil elektrodeposisi. Metode penelitian meliputi pembuatan larutan elektrolit, preparasi elektroda stainless steel, serta integrasi sistem monitoring dengan perangkat mikrokontroler. Hasil penelitian menunjukkan bahwa sistem mampu memantau arus dan tegangan secara akurat, mendeteksi pelepasan gas H_2 selama proses, serta menghitung massa nikel sesuai perhitungan Hukum Faraday. Dengan demikian, alat ini efektif digunakan sebagai sistem monitoring otomatis untuk meningkatkan kontrol parameter pada proses elektrodeposisi nikel.

Kata Kunci: Elektrodeposisi, sensor INA219, sensor MQ-8, arus listrik, Hukum Faraday.

ABSTRACT

Automatic Current and Voltage Monitoring Device in Nickel Electrodeposition Process with H_2 Gas Detection and Nickel Mass Calculation Using Faraday's Law

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This research discusses the design of an automatic current and voltage monitoring system in the nickel electrodeposition process with H_2 gas detection and nickel mass calculation using Faraday's Law. The objective of this study is to develop a monitoring device based on INA219 and MQ-8 sensors integrated with a microcontroller to record data in real-time, as well as to analyze the relationship between current variations, process duration, and hydrogen gas release on the electrodeposition results. The research method includes the preparation of the electrolyte solution, stainless steel electrode treatment, and system integration with a microcontroller. The results show that the system is capable of accurately monitoring current and voltage, detecting H_2 gas release during the process, and calculating nickel mass in accordance with Faraday's Law. Therefore, this device can be effectively used as an automatic monitoring system to improve parameter control in the nickel electrodeposition process.

Keywords: *Electrodeposition, INA219 sensor, MQ-8 sensor, electric current, Faraday's Law.*