

ABSTRAK

PENGARUH VARIASI LUAS SEPARATOR BERBAHAN ALUMINA, KARBON DAN SEMEN TERHADAP REGENERASI ANODA ZINC DALAM SISTEM ELEKTROKIMIA AIR LAUT

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Separator merupakan komponen sel elektrokimia yang berfungsi membatasi kontak langsung antar elektroda, namun tetap memungkinkan perpindahan ion. Penelitian ini bertujuan mengkaji pengaruh variasi jumlah lubang pada separator terhadap performa dan regenerasi anoda seng (Zn) dalam sel elektrokimia berbasis air laut. Separator berbahan campuran semen, alumina, dan karbon divariasikan jumlah lubang: lima, enam, dan sembilan. Sel menggunakan elektroda Zn sebagai anoda, serabut tembaga (Cu) sebagai katoda, serta larutan Acid Zinc dan air laut sebagai elektrolit. Parameter yang dianalisis meliputi tegangan tanpa beban, tegangan dengan beban, arus listrik, dan intensitas cahaya (lux). Pengukuran dilakukan setiap 15 menit selama 5 jam. Hasil menunjukkan jumlah separator sembilan lubang menghasilkan performa tertinggi (1,6 mA; 73 lux) menandakan reaksi elektrokimia awal yang kuat. Jumlah lubang lebih banyak mendukung aliran ion dan reaksi lebih lama, sedangkan lubang lebih sedikit mempercepat penurunan performa.

Kata kunci: Separator, *Acid Zinc*, Air laut, Elektrokimia

ABSTRACT

THE EFFECT OF SEPARATOR SURFACE AREA VARIATIONS COMPOSED OF ALUMINA, CARBON AND CEMENT ON ZINC ANODE REGENERATION IN A SEAWATER- BASED ELECTROCHEMICAL SYSTEM

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The separator is a component in an electrochemical cell that functions to prevent direct contact between electrodes while still allowing ion transfer. This study aims to examine the effect of the number of holes in the separator on the performance and regeneration of the zinc (Zn) anode in a seawater-based electrochemical cell. The separator, made from a mixture of cement, alumina, and carbon, was varied by the number of holes: five, six, and nine. The cell used a Zn electrode as the anode, copper (Cu) fibers as the cathode, and Acid Zinc solution along with seawater as the electrolyte. Parameters analyzed included open-circuit voltage, load voltage, electric current, and light intensity (lux). Measurements were taken every 15 minutes for 5 hours. The results showed that the separator with nine holes produced the highest performance (1.6 mA; 73 lux), indicating a strong initial electrochemical reaction. A greater number of holes supported better ion flow and sustained reaction, while fewer holes led to a faster decline in performance.

Keywords: Separator, Acid Zinc, Seawater, Electrochemistry