ABSTRACT

Capacitive Deionization (CDI) is a desalination technology with a basic principle similar to a capacitor, which is to absorb ions dissolved in salt water through the provision of an electric potential of 1.2V. This study aims to make CDI cells with high discharge, namely 10ml/minute, 40ml/minute and 120ml/minute. To maximize the ability to reduce salt content, configuration variations of three CDI cells arranged in parallel were also carried out. Tests were also carried out after the CDI cell washing process using the capacitor discharge principle, which aims to determine the reproducibility of CDI cells. Desalination capability is calculated based on the comparison of the conductivity of the saline solution before and after desalination using *Total Disolved Solid* (TDS). The results of this study obtained the efficiency of reducing salt content with a different number of cycles for each variation of the discharge, namely in the first measurement the discharge 10ml/minute 26.58% with 23 cycles, flow rate 40ml/minute 38.12% with 69 cycles and discharge 120ml/minute 15, 53% with 118 cycles. In the second measurement (after washing the CDI cells) the flow rate was 10ml/minute 19.46% with 37 cycles, 40ml/minute was 27.02% with 82 cycles and the discharge was 120ml/minute 9.2% with 77 cycles. For the CDI cell configuration arranged in parallel with a discharge of 120ml/min, the efficiency of reducing salt content was 39.96% with 119 cycles. The results of the research can be concluded that at low discharge the absorption of salt content is more maximal than the variation of higher discharge. In addition, the use of parallel configuration can increase the efficiency of reducing salt content which is linear with the number of parallelized CDI cells.

Keywords: *Capacitive Deionization, CDI, Electrodes, Fabrication, Desalination, Seawater, Saltwater.*