Effect of Iodine Molar Ratio on the Electrochemical Performance of Electrodialysis Cell in Sulfur Iodine Process

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The electrochemical performance of electrodialysis cell for concentrating hydriodic acid in $HI-I_2-H_2O$ solution was investigated by changing iodine molar ratio. For this purpose, electrochemical cell with active surface area of 5 cm x 5 cm was prepared. Nafion 117 and carbon fiber clothes were used as proton exchange membrane and electrodes of the cell, respectively. The initial molar ratio of hydriodic acid to water was kept below azeotrope composition with addition of iodine below the solubility limit at a given temperature and composition. The pressure difference between anode and cathode was maintained below 5 bar with system pressure higher than 2 bar. The polarization curves and solution compositions were measured with operation time. In this study, the feasible electrodialysis cell operation conditions were discussed.