

Supplementary Materials

Bipolar Membrane Electrodialysis for Cleaner Production of Diprotic Malic Acid: Separation Mechanism and Performance Evaluation

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Citation: He, J.; Zhou, R.; Dong, Z.; Yan, J.; Ma, X.; Liu, W.; Sun, L.; Li, C.; Yan, H.; Wang, Y.; et al. Bipolar Membrane Electrodialysis for Cleaner Production of Diprotic Malic Acid: Separation Mechanism and Performance Evaluation. *Membranes* **2023**, *13*, 197. <https://doi.org/10.3390/membranes13020197>

Academic Editor: Seunghyeon Moon

Received: 5 January 2023

Revised: 19 January 2023

Accepted: 2 February 2023

Published: 5 February 2023



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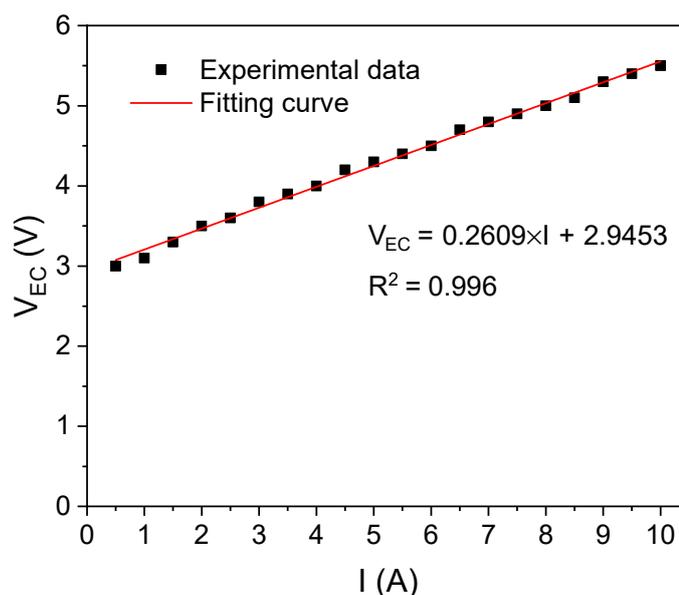


Figure S1. Voltage drops between the anode and cathode compartments (V_{EC}) as a function of current (I). Notes: The V_{EC} was measured in a stack that assembled only one piece of bipolar membrane, and the electrode rinse solution was 0.3 mol/L Na_2SO_4 .

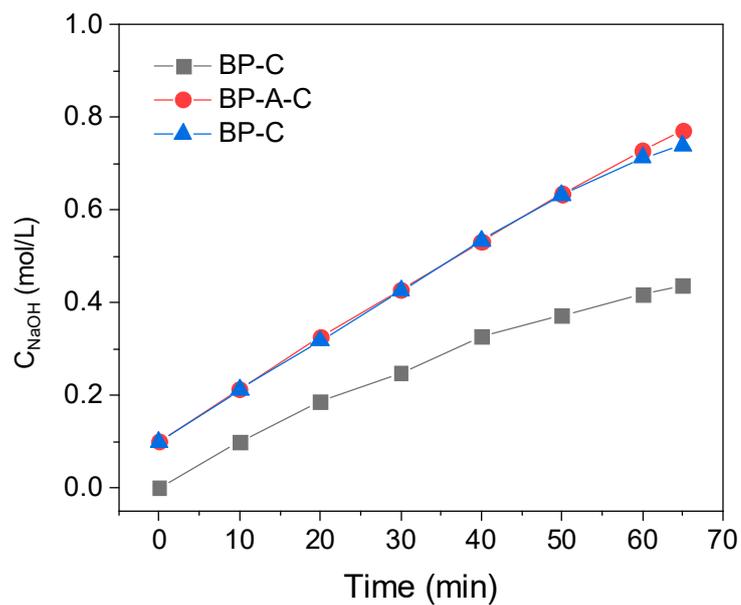


Figure S2. The concentration of NaOH in base compartment for different configurations as a function of time. Notes: current density, 20 mA/cm²; feed concentration, 0.5 mol/L.

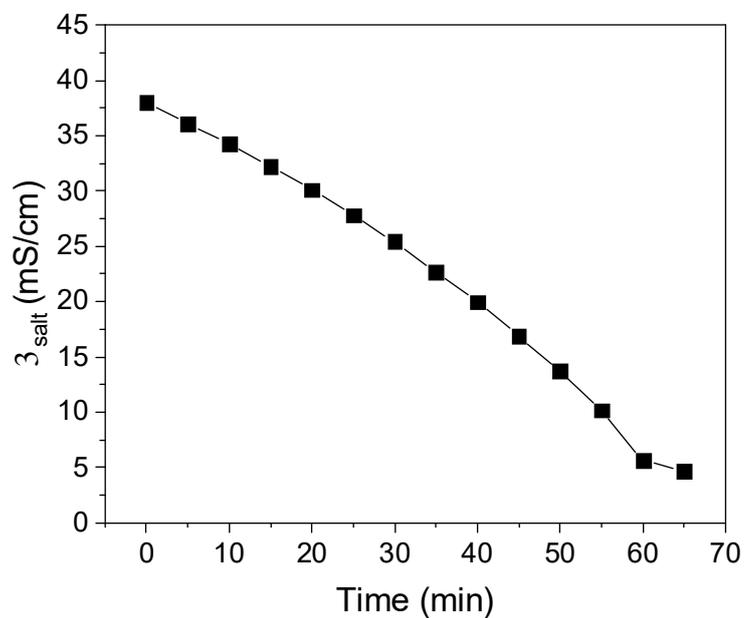


Figure S3. The conductivity of salt solution (σ_{salt}) using BP-A-C configuration as a function of time. Notes: current density, 20 mA/cm²; feed concentration, 0.5 mol/L.

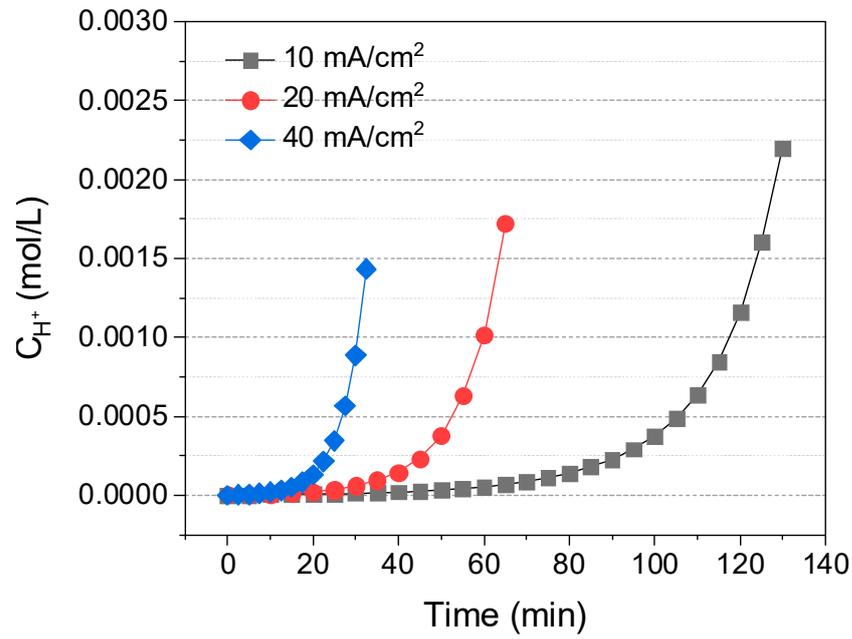


Figure S4. The concentration of H⁺ in acid compartment at various current densities as a function of time. Notes: the concentration of H⁺ was calculated from the solution pH; BP-C configuration; feed concentration, 0.5 mol/L.

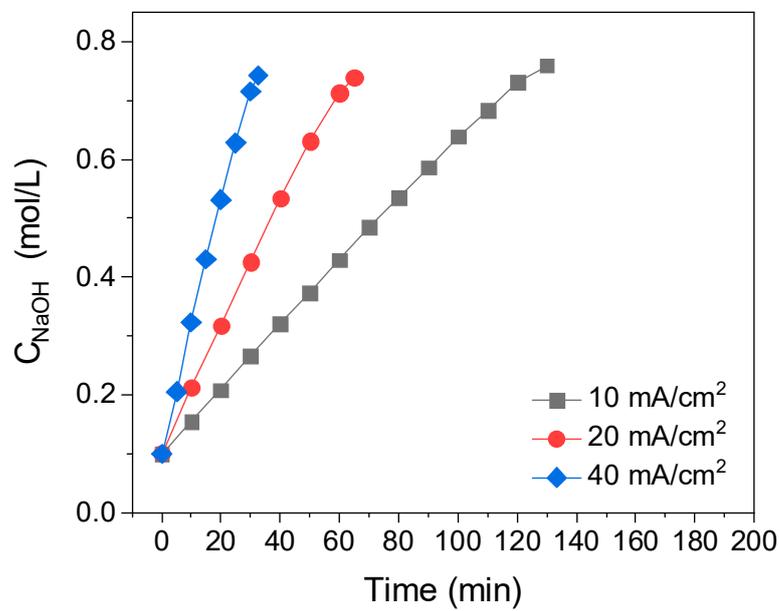


Figure S5. The concentration of NaOH in base compartment at various current densities as a function of time. Notes: BP-C configuration; feed concentration, 0.5 mol/L.

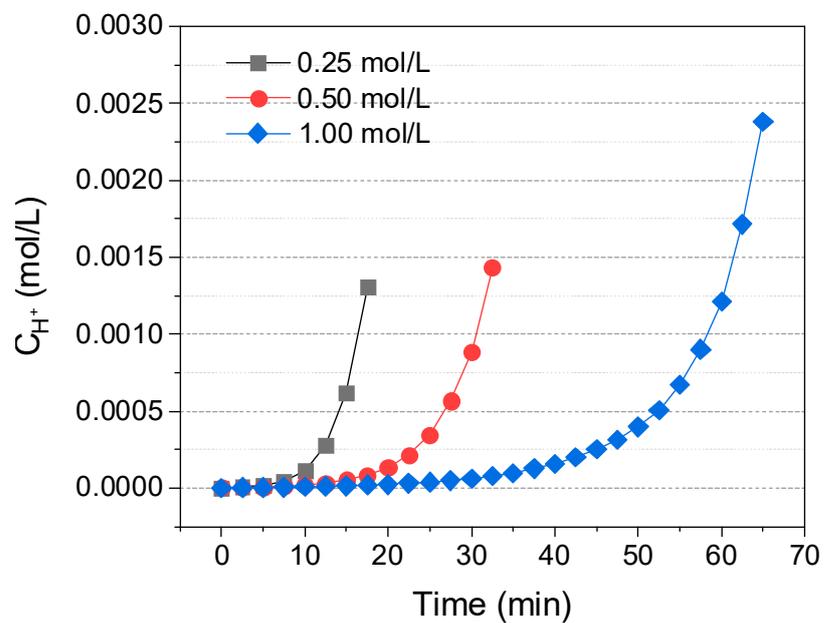


Figure S6. The concentration of H^+ in acid compartment at various feed concentrations as a function of time. Notes: the concentration of H^+ was calculated from the solution pH; BP-C configuration; current density, 40 mA/cm².

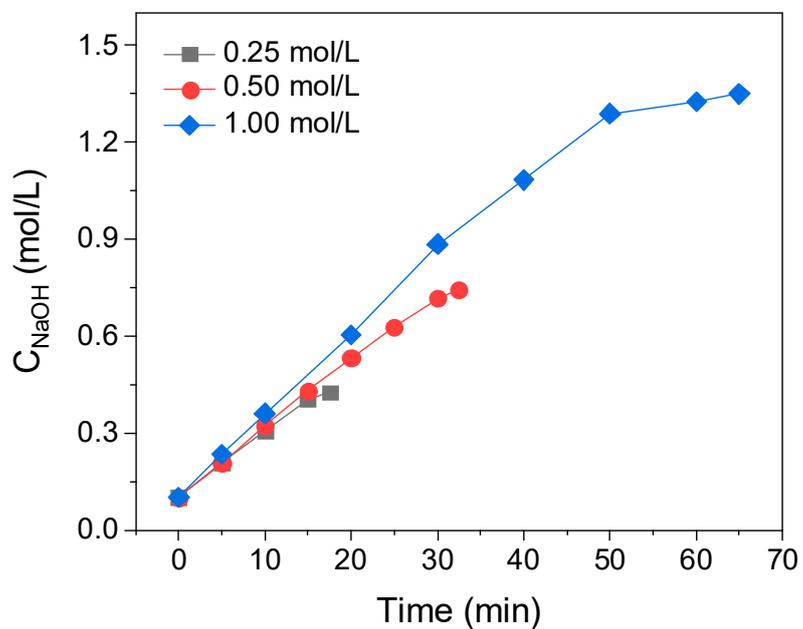


Figure S7. The concentration of NaOH in base compartment at various feed concentrations as a function of time. Notes: BP-C configuration; current density, 40 mA/cm².