# SUPPLEMENTARY INFORMATION

## Nanoscale Carbonaceous Materials via Element Plant Hyperaccumulation for Electrochemical Desalination Application

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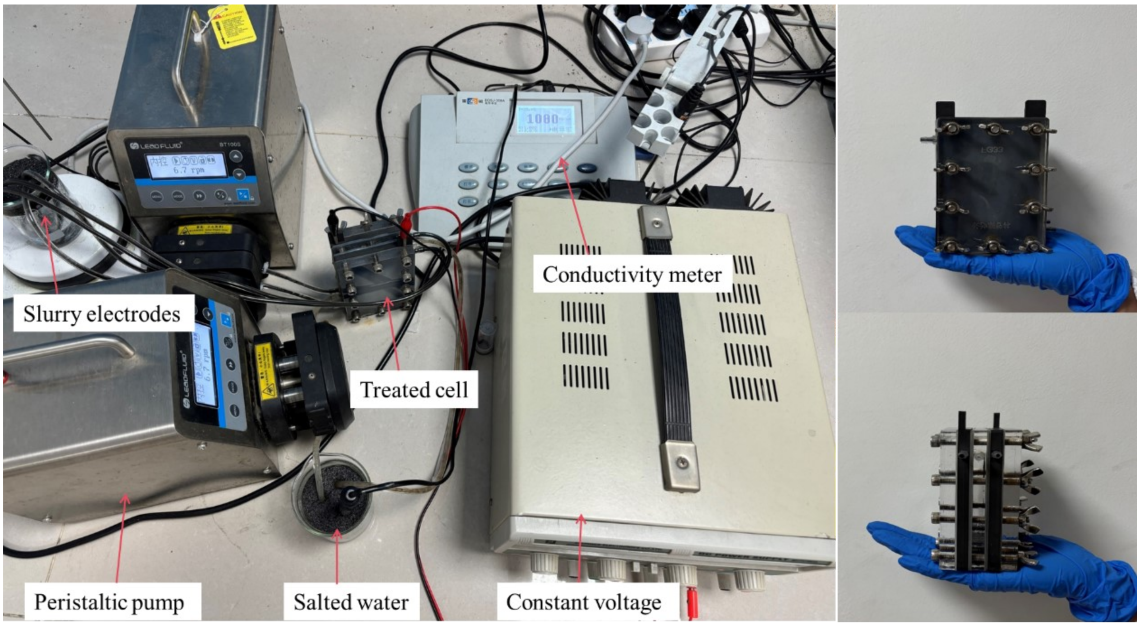


Fig. S1 Schematic diagram of the FCDI system.

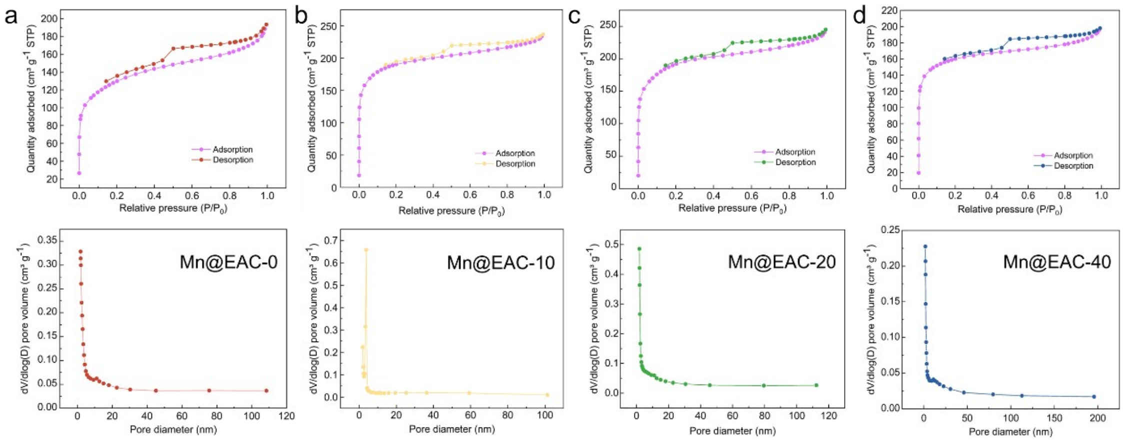


Fig. S2 $N_2$ adsorption-desorption curves and pore size distribution of Mn@EAC-*x*.

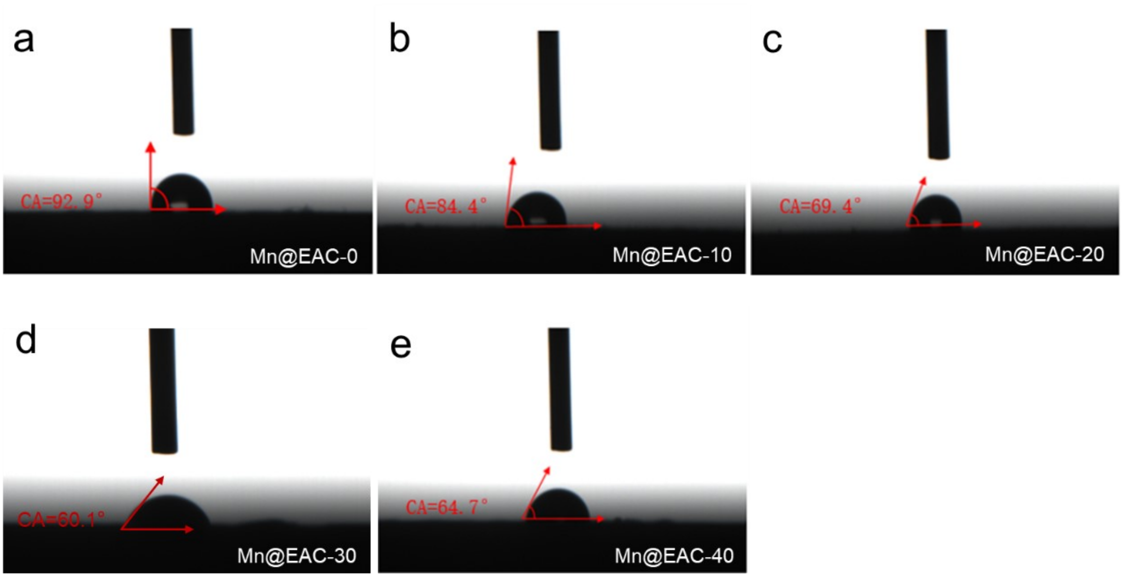


Fig. S3 Contact angle test of Mn@EAC-*x* materials in 1 M NaCl solution.

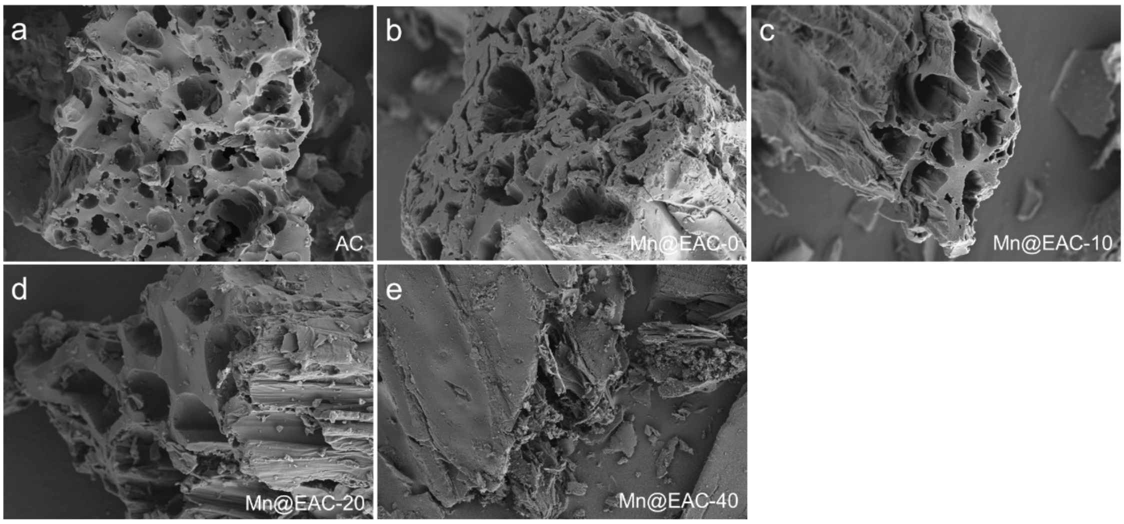


Fig. S4 SEM images of the AC and Mn@EAC-*x*.

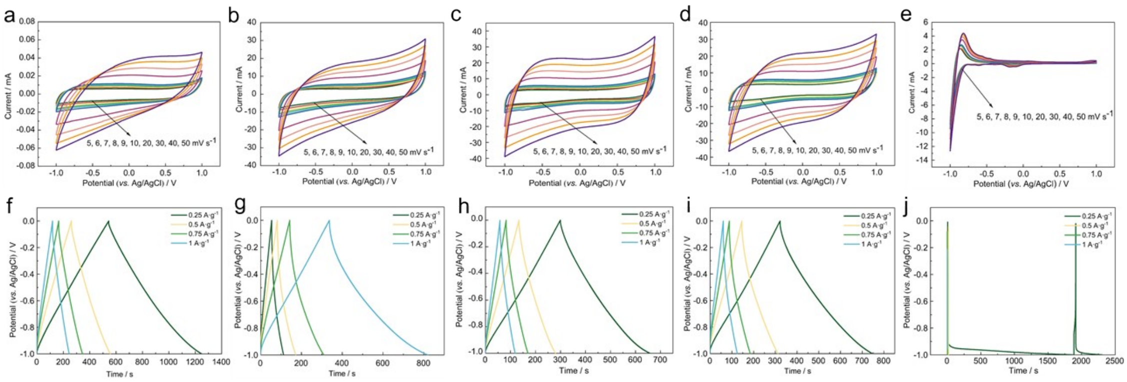


Fig. S5 Electrochemical performance of AC and Mn@EAC-*x* composites in a 1 M NaCl aqueous solution. (a-e) Cyclic voltammetry (CV) curves of (a) AC, (b) Mn@EAC-0, (c) Mn@EAC-10, (d) Mn@EAC-20, and (e) Mn@EAC-40 at different scan rates. (f-j) Galvanostatic charge-discharge (GCD) curves of (f) AC, (g) Mn@EAC-0, (h) Mn@EAC-10, (i) Mn@EAC-20, and (j) Mn@EAC-40 at different current densities.

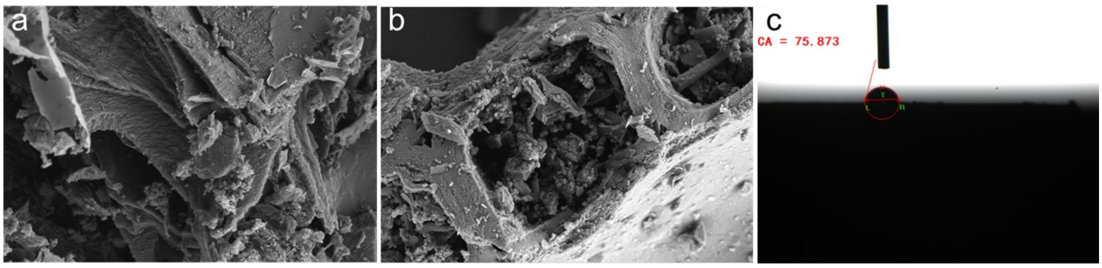


Fig. S6 SEM images and contact angles of the Mn@EAC-30 material after prolonged desalination cycles.

Tab. S1 The specific surface area and average pore size of the Mn@EAC-*x* materials.

| **Parameter** | Mn@EAC-0 | Mn@EAC-10 | Mn@EAC-20 | Mn@EAC-30 | Mn@EAC-40 |
|---|---|---|---|---|---|
| BET Surface Area / $m^2$ $g^{-1}$ | 433.81 | 516.37 | 619.82 | 635.24 | 489.74 |
| Average pore diameter / nm | 3.72 | 4.31 | 3.67 | 3.36 | 3.65 |

Tab. S2. Specific capacitances of AC and Mn@EAC-*x* at different current densities.

| Material | 0.25 A $g^{-1}$ | 0.5 A $g^{-1}$ | 0.75 A $g^{-1}$ | 1.0 A $g^{-1}$ |
|---|---|---|---|---|
| AC / F $g^{-1}$ | 176.03 | 147.90 | 135.45 | 126.10 |
| Mn@EAC-0 / F $g^{-1}$ | 120.91 | 83.65 | 67.58 | 57.52 |
| Mn@EAC-10 / F $g^{-1}$ | 90.23 | 73.05 | 65.48 | 60.70 |
| Mn@EAC-20 / F $g^{-1}$ | 106.38 | 82.60 | 72.68 | 64.10 |
| Mn@EAC-30 / F $g^{-1}$ | 137.30 | 102.90 | 88.80 | 78.80 |