Supplementary material for：

Electrodeposition model with dynamic ion diffusion coefficient for predicting void defect in electroformed microcolumn array

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The supplementary materials contain 2 pages, including 1 figure.

Part1: Fabrication of microelectrodes with different aspect ratios

The microcolumn array with a depth of 60 μm and widths of 24, 30, 40, 60, 90 and 120 μm were fabricated by soft lithography. The specific experimental steps are as follows. First, using anhydrous ethanol and deionized water to clean the 8K mirror-polished stainless steel substrate, and placed it on a 120 °C glue baking table for 10 minutes. According to the SU-8 3025 photoresist instruction manual to determine the process parameters, SU-8 spined at 500 rpm for 10 s with acceleration of 100 rpm/second and spined at 1300 rpm for 30 s with acceleration of 300 rpm/second, and SU-8 layer with a thickness of about 60 μm was obtained. The devices were baked on a hot plate at 95 °C for 15 min, and exposed on a UV lithography machine (URE-2000/35L) at an exposure dose of 230 mJ/cm^2, and the structure of the mask was copied to the photoresist layer. The substrate was placed on a drying table at 65 and 95 °C for 1 min and 5 min, respectively. Finally, it was developed in PGMEA developer solution for 6 min, and washed with isopropanol solution.

Part2: Polarization curves of microchannels with a depth of 60 μm and an aspect ratio of 2.5:1 to 1:2

The polarization curves of the microchannels with different aspect ratios

mentioned above were tested repeatedly. The stirring speed is 400 r/min, the scanning speed was 0.04 V/s, the sampling interval was 0.005 V, and the start and end potentials were -0.3 V and -1.8 V, respectively. The sensitivity is set to 10^{-2} A/V.

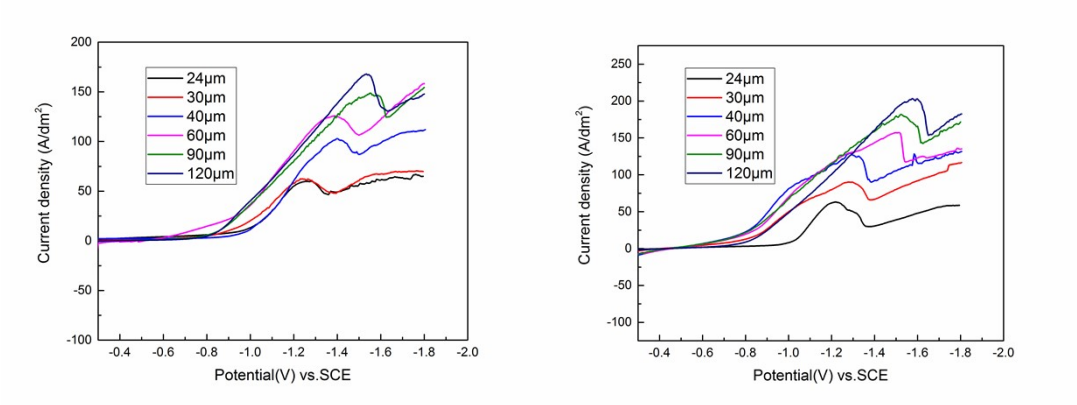

Fig. S.1. The experimental polarization curve of microchannels with different aspect ratio (2.5:1 to 1:2)