

Supplementary Material

An ordinary differential equation model for simulating local-pH change at electrochemical interfaces

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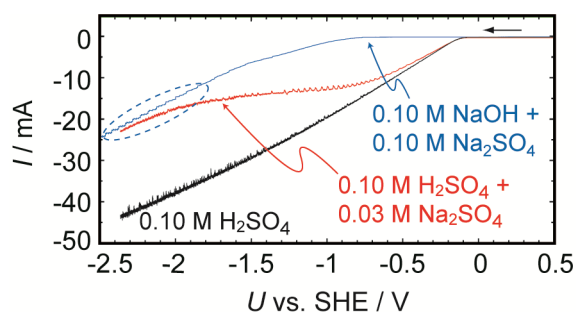


Figure S1 Current (I) - potential (U) curves for H_2SO_4 and NaOH solutions as obtained under controlled potential conditions at a scan rate of 0.01 V s^{-1} . The working electrode was a 2 mm diameter Pt disc.

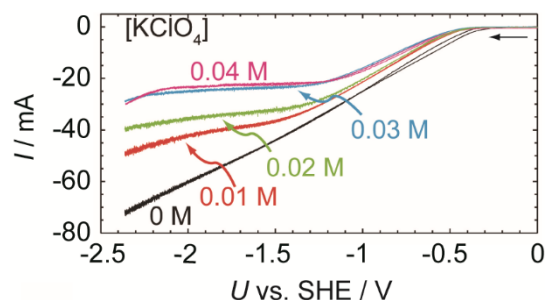


Figure S2 I - U curves for $0.15 \text{ M HClO}_4 + x \text{ M KClO}_4$ solutions where x is 0, 0.01, 0.02, 0.03 and 0.04, as obtained under controlled potential conditions at a scan rate of 0.01 V s^{-1} . The working electrode was a 4 mm length Au wire (0.5 mm in diameter).

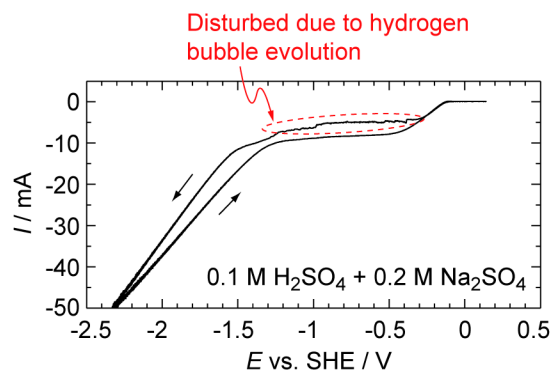


Figure S3 An $I - U$ curve for 0.1 M H_2SO_4 solution containing 0.2 M Na_2SO_4 as obtained under controlled potential conditions at a scan rate of 0.01 V s^{-1} . The working electrode was a 4 mm length Pt wire (0.5 mm in diameter).

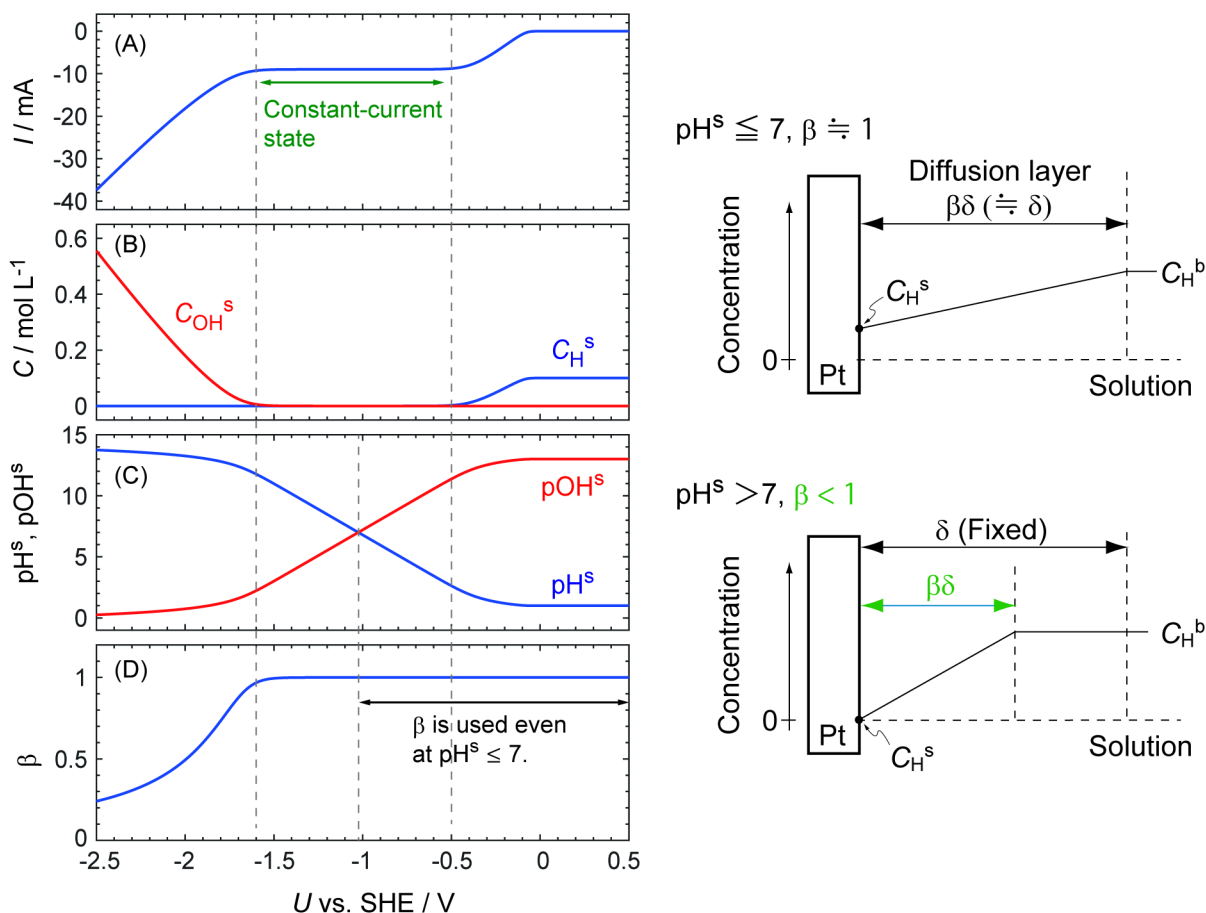


Figure S4 (left) Simulated curves generated using the same process as described in the caption to Figure 6 except that Eq. 17-2 was used to calculate dC_{H^+}/dt . (right) The near-surface concentration profile of H^+ ions.

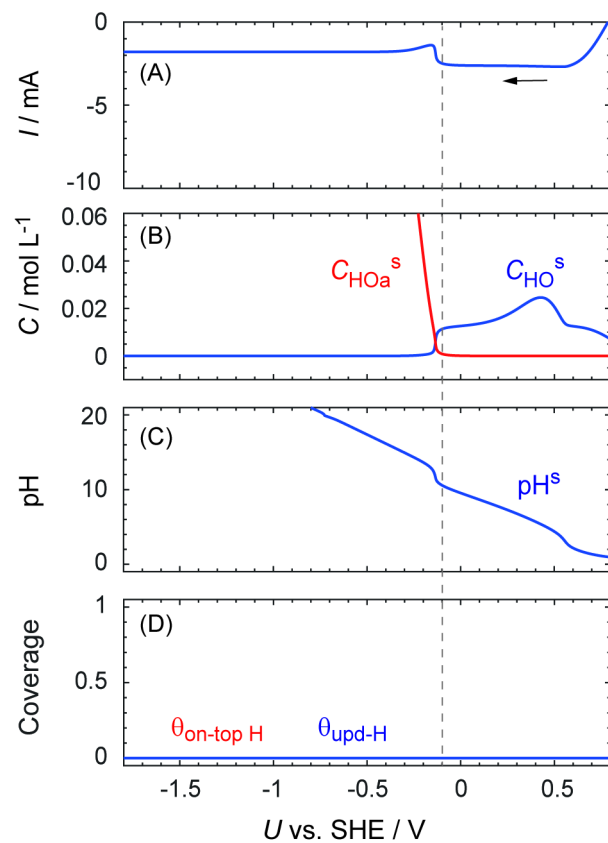


Figure S5 Simulated curves generated using the same process as described in the caption to Figure 8 except that Eq. 17 was used to calculate dC_{H}^s/dt .