

## Supporting Information

Hydrogen nanobubbles at roughness regulated surfaces;  
Why does the normal hydrogen electrode need a platinized-platinum electrode?

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Figure S1

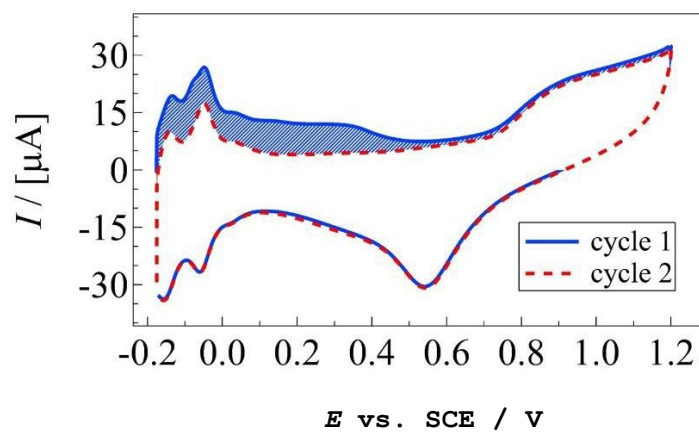


Figure S1. The first (blue line) and the second (red line) cyclic voltammograms with the potential scanning rate of 100m V/s. The electrode potential was held at -0.2 V vs. SCE for 50 s in advance to the first potential scan. The charge in the blue hatched line is attributed to the oxidation charge of the hydrogen molecules in the nanobubbles.

Figure S2

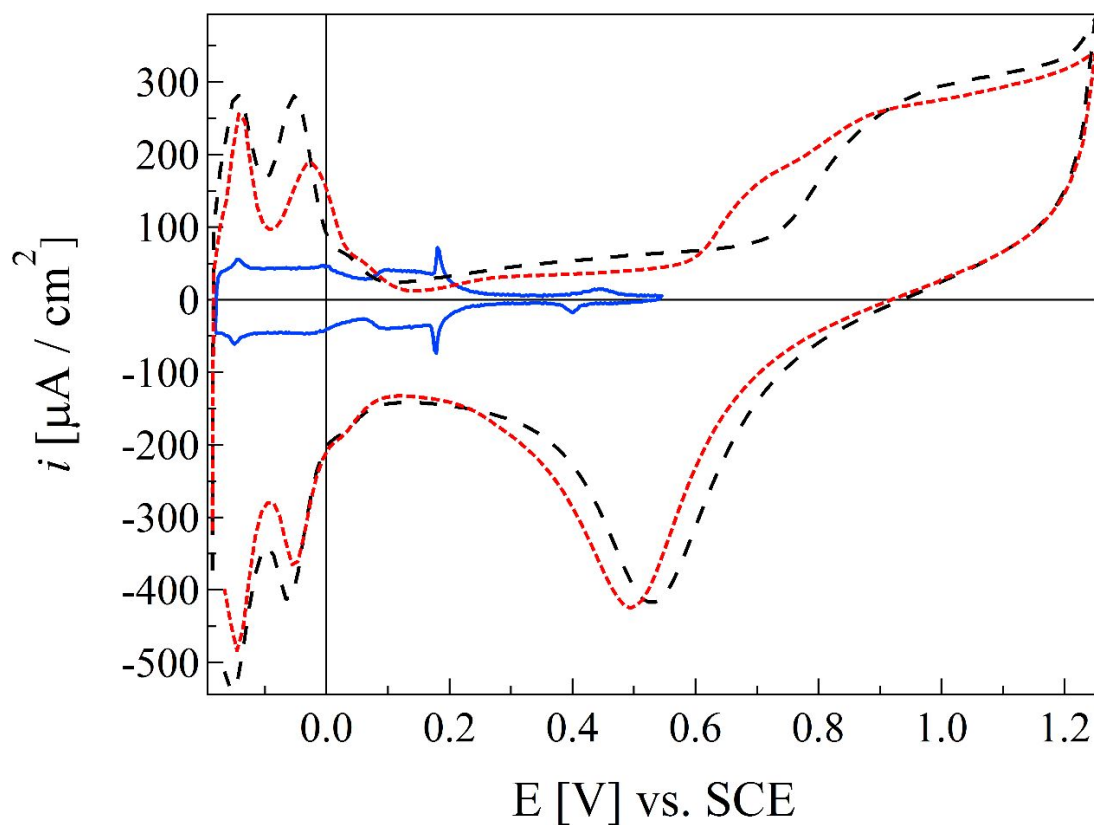


Figure S2. The cyclic voltammograms of the platinum electrodes in degassed 0.1M sulfuric acid aqueous solution. The blue line represents the CV at Pt (111). The red and black CVs are obtained at the platinized platinum electrodes. The shapes of CV are varied between the red and the black lines depending on uncontrollable difference in the electrodeposition.