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Electrocatalysis at Single Nanoparticles

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Title: Electrocatalysis at single nanoparticles

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Appendix B:

Additional experiments for chapter 4

Overview of the Faraday Cage and flow-cell

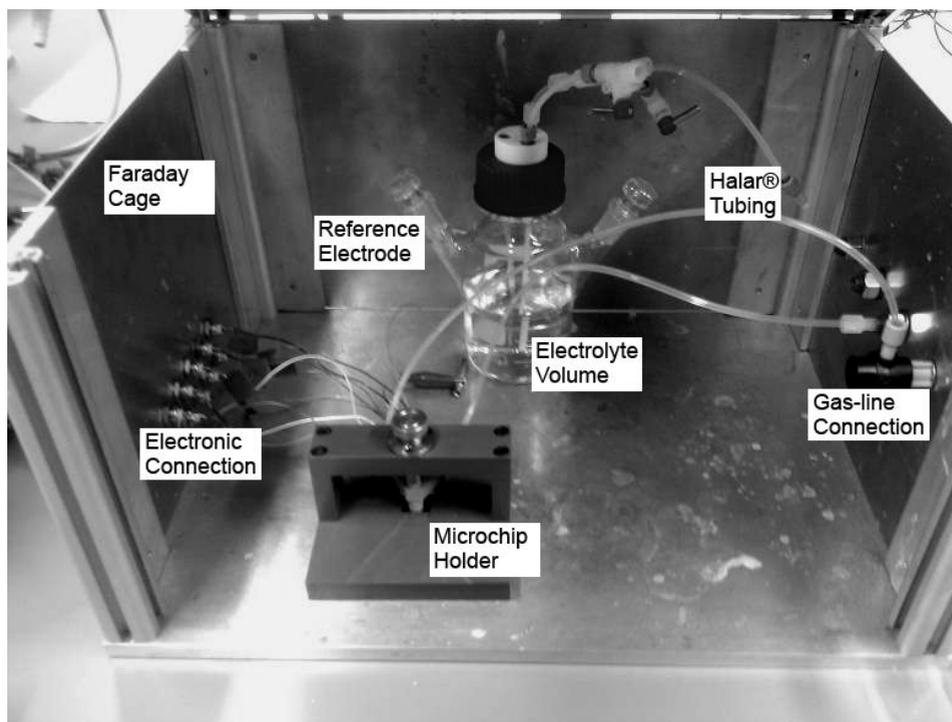


Figure 1: A photograph of the Faraday Cage used throughout the experiments described in chapters 3 and 4. Halar tubing is used to transport electrolyte from the source volume, via the microchip, to the drain volume (consisting of a glass cell not depicted here to maintain clarity). Commercial reference electrodes are inserted in the source volume through the NS15 ground joint.

Landing Pt NPs on a commercial UME

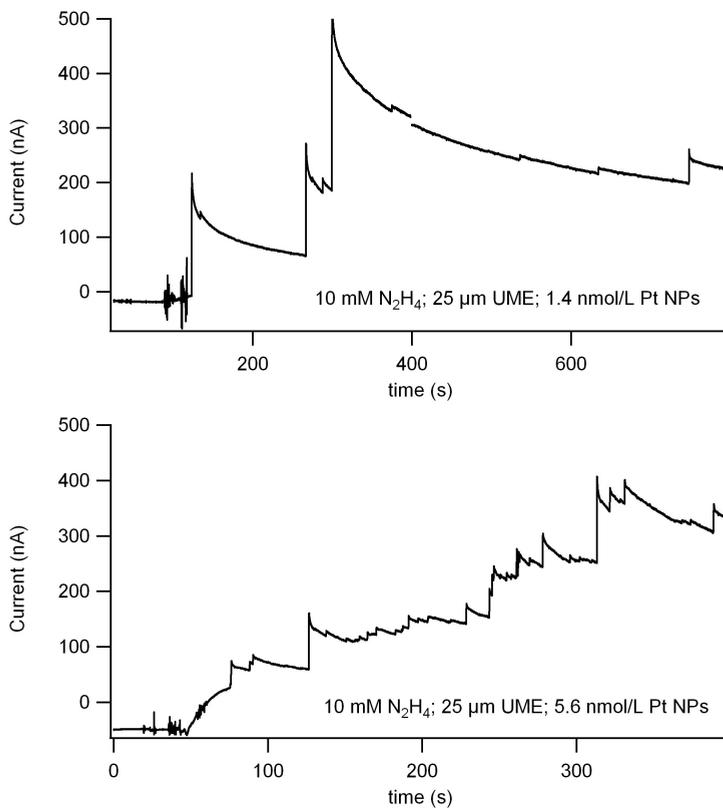


Figure 2: Pt NPs impacting on a 25 μm Au UME in a glass cell containing 100 mL of 10 mM pH 8 phosphate buffer, for two different Pt NP concentrations.

The use of hydrogen as electrocatalytic substrate

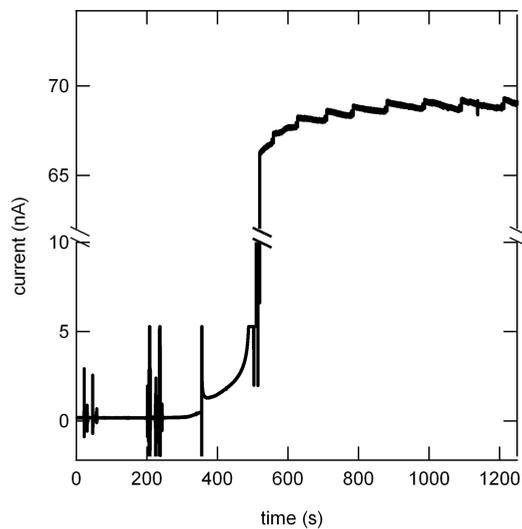
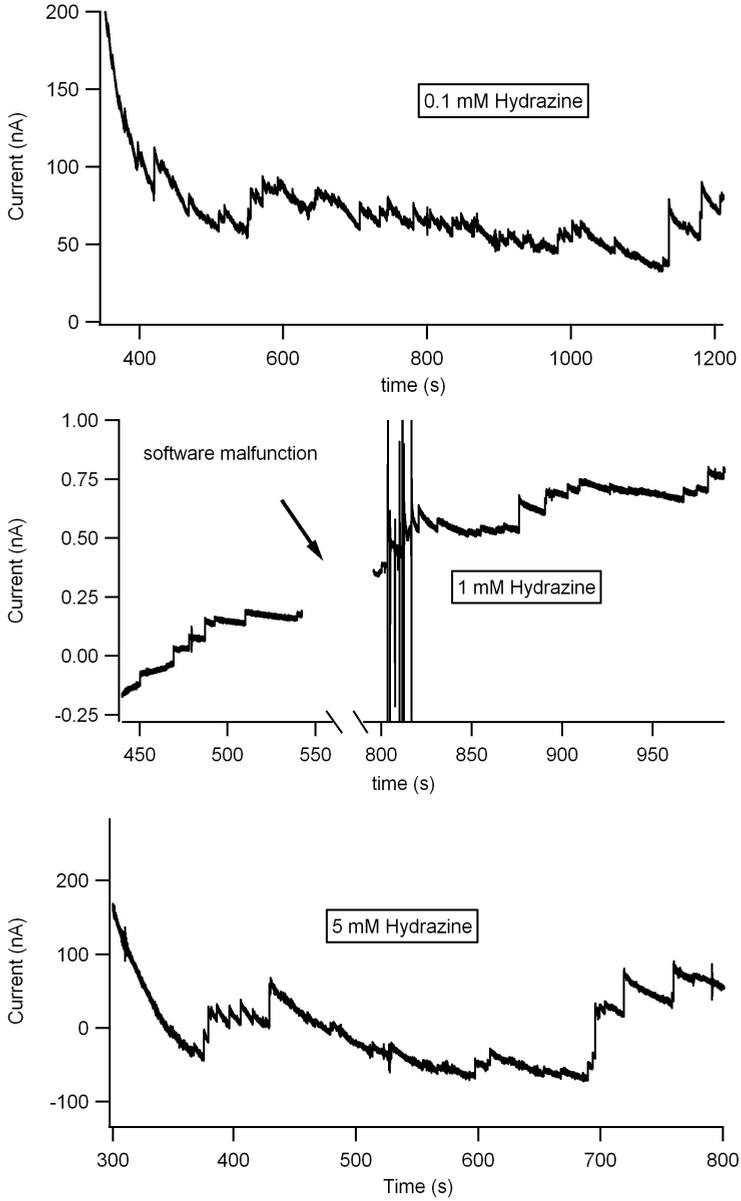
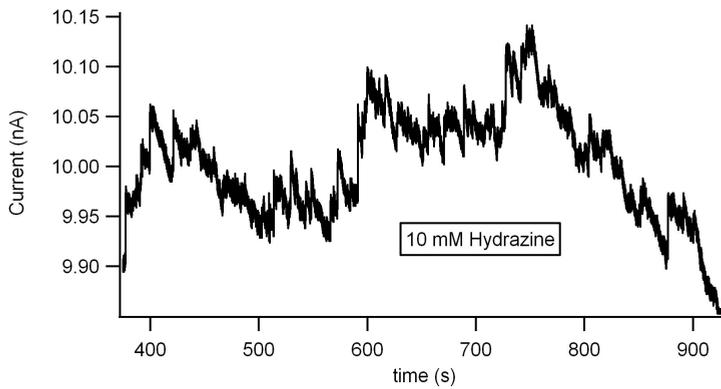
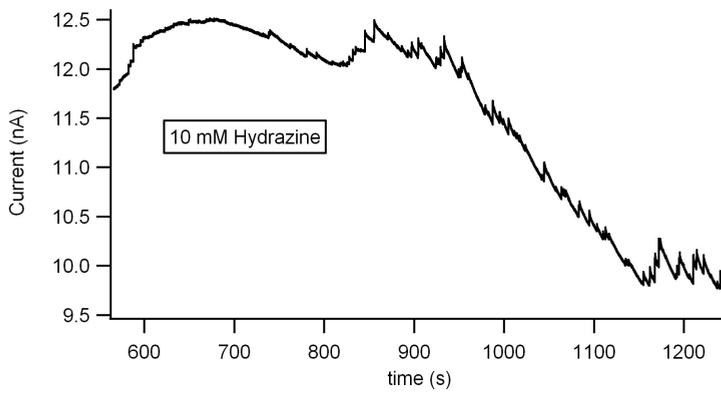
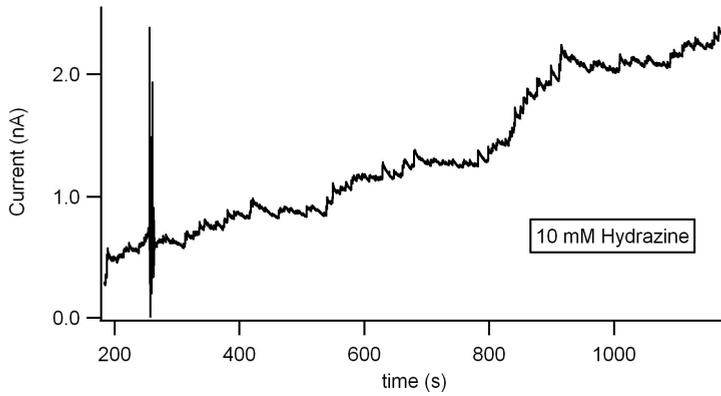


Figure 3: NP detection using $\text{H}_2(\text{g})$ as the electrocatalytic substrate, in 10 mM phosphate buffer at pH 8, with an applied potential of 0.5V.

The influence of the hydrazine concentration





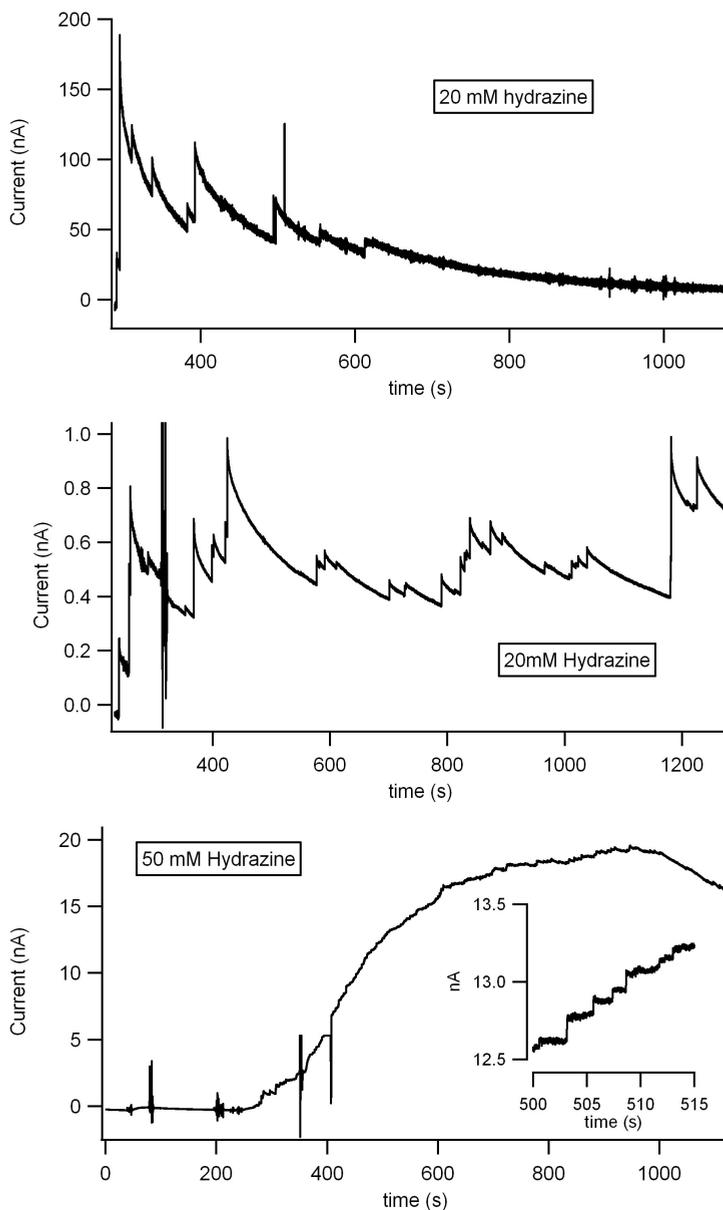


Figure 4: Chronoamperometric measurements of Pt NP impacts on lithographically patterned Au UMEs, using ascending concentrations of hydrazine. The order of data presentation maintains that of table 1 in chapter 4.