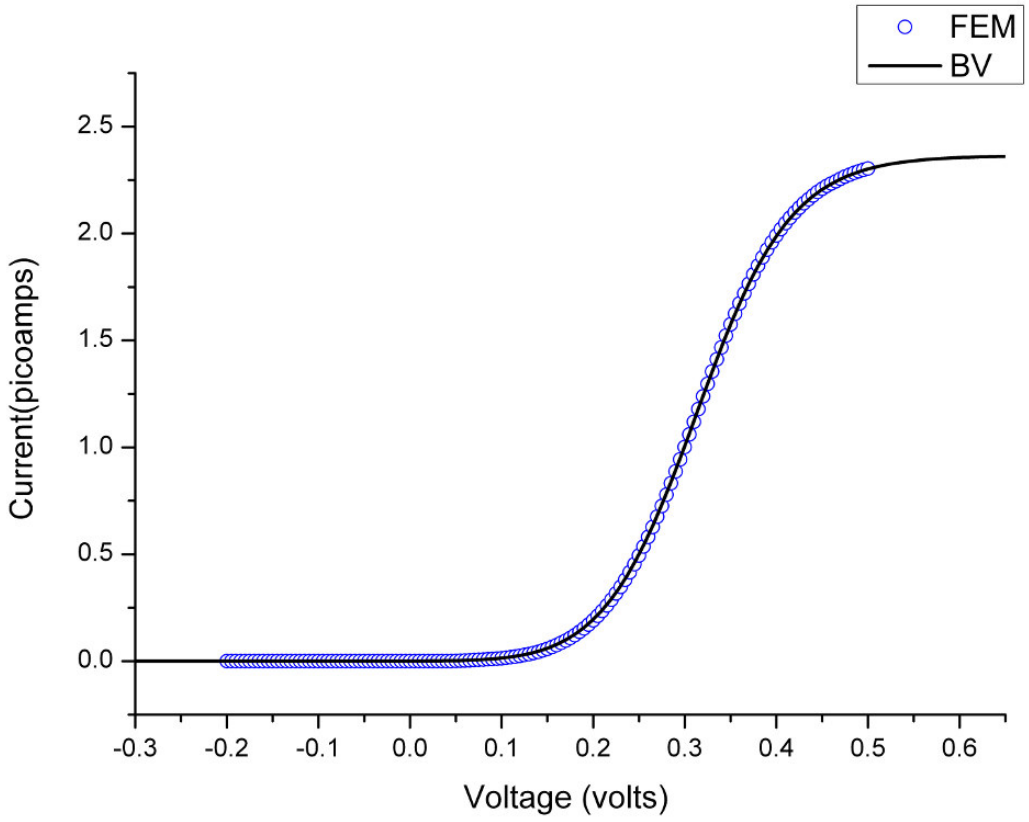
Supporting information:



Finite Element Model predicted voltammetry response for a single potential sweep (from -0.2 V to 0.5 V) for a hemispherical electrode with radius R=25nm. The Finite Element Model(FEM) solution (blue circles) follows the behavior predicted by the Butler-Volmer equation for a one-step, one-electron process[1](solid line):

$$I_{BV} = \frac{I_{mt}}{1 + e^{-\frac{F}{RT}(E-E^0)} + \frac{I_{mt}}{FACk^0} \cdot e^{-\frac{F}{RT}(1-\alpha)(E-E^0)}}$$

A is the electrode area. I_{mt} was used as the only fit parameter: I_{mt} =2.36 pA. The values of various electrochemical constants used in FEM are: E^0=0.219 Volts, α=0.5, k^0= 1.5 cm/s, D_0=7.8x10^{-10} m^2/s, T=298 K.

1. Heller, I.; Kong, J.; Heering, H. A.; Williams, K. A.; Lemay, S. G.; Dekker, C., Individual Single-Walled Carbon Nanotubes as Nanoelectrodes for Electrochemistry. *Nano Letters* **2005,** *5* (1), 137-142.