1014-35-950 **Y. Sujeet Bhat*** (`ybhat@math.ufl.edu`), 358 Little Hall, Dept. of Mathematics, University of Florida, Gainesville, FL 32611. *Homogenization of a nonlinear elliptic boundary value problem modeling galvanic currents.*

We study a nonlinear elliptic boundary value problem arising from electrochemistry in the study of heterogeneous electrode surfaces. The boundary condition is of exponential type and has a periodic structure. We find a limiting or effective problem as the period approaches zero, along with a first order correction. We establish convergence estimates and provide numerical experiments. (Received September 26, 2005)