Read Chapter 4, answer the following problems, and indicate with whom you worked: ______________.

(1) Do problems 1.11, 1.12, 2.10, and 4.1 in Bard and Faulkner (B&F).

(2) Given a 1 cm^2 perfectly flat and atomically smooth electrode, a second electrode with a roughness factor of 10, and a third electrode made of the same material as the first electrode but with ten times the geometric surface area, answer the following. *Choose any electrolyte condition you wish, but state the condition you chose.*

   a. On one set of axes, plot a non-hysteretic *I*–*E* curve for each electrode when it is the WE in a three-electrode set-up.
   b. On one set of axes, plot a non-hysteretic *J*–*E* curve for each electrode when it is the WE in a three-electrode set-up.

(3) In Trotochaud, Ranney, Williams, and Boettcher, *Journal of the American Chemical Society*, 2012, *134*, 17253 (see class website), the authors plot of their *J*–*E* curves with more complex abscissa axes (e.g. Figure 3 and Figure 6). With this in mind, answer the following.

   a. Why is iR_u subtracted from the values of the potential?
   b. How would the plots have changed if iR_u had not been subtracted from the potentials? Show this graphically and/or describe it in words.
   c. Explain the difference(s) between the top and bottom abscissa axes <u>and</u> why it was useful to show both.
   d. The data in the inset of Figure 6 can be obtained by integrating *I*–*t* curves with respect to time. However, the data can also be obtained using the *J*–*E* curves shown in the main part of the figure, and the scan rate. Explain how the data in the figure inset was calculated from the data in the main part of the figure.