

Chemistry 4114 – Homework problems

Electrochemistry

1. Explain why making the electrode potential more negative favors reduction of species on the solution side of the interface.
2. When changing the potential of a conducting phase, one is adding charge to that phase (e.g. if the potential of a conducting phase is made more negative, that is equivalent to adding negative charge to that phase). Gauss showed that for a conducting phase, excess charge exists only on the surface of that phase. Given this description, describe what happens to the Electrical Double Layer when changing the potential of the electrode.
3. There are 3 sources of current in an electrolytic electrochemical measurement. What are those sources of current? Which contribute to the signal and which contribute to the noise.
4.
 - a. For a heterogeneous electrochemical process that is subject only to diffusion mass transport, what is the relationship between current and time? Explain.
 - b. For a heterogeneous electrochemical process that is subject to electrical migration mass transport, what is the relationship between current and time? Explain.