E 45 CORROSION LAB REPORT

NAME: _______________________

LAB SECTION: ____________

QUESTIONS. Answer the following questions completely and concisely.

Explain electrochemical corrosion. How does it occur? What four components are required for it to occur? Be sure to describe the function of each of the components.

Describe the galvanic couple you constructed in Experiment 1. Clearly identify all the components in the electrochemical system and explain why corrosion proceeded as it did. Which metal was the anode? Explain.

What was the corrosion rate of the anode (report your answer in mpy)?

Explain your Experiment 2 results. Why does steel wool corrode if it is placed in an open container of water for a week? Does the same thing happen if the container is closed? Explain. What does this result imply about the availability of reactants?

What happens if steel wool is placed in contact with zinc in an open container of water? Explain. Would you expect the same behavior as with steel wool and zinc in a two metal system with steel wool wrapped around copper? Explain. Could you use this behavior to advantage?
Describe in general how a potential series is constructed. What type of information is available from a potential series? How can one be used effectively?

Construct a potential series based on the electrolyte and conditions you used in Experiment 3. Include the relative voltages and indicate which direction is active. (You may choose any metal as a reference.)

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<tr>
<th>Metal</th>
<th>potential</th>
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<tr>
<td></td>
<td>more anodic</td>
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<td>more cathodic</td>
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comments:

From your observations in Experiment 3 and your knowledge of electrochemical cells describe in general how batteries are constructed and provide energy. What must happen be in order for a battery to be rechargable?

Explain the passivation behavior of iron in nitric acid. Refer to your observations from Experiment 5. What do you think would happen to the passivated sample of iron if left in dilute nitric acid for a long time? Explain.
Based on the results of **Experiment 6** explain the effect of varying the relative anode size or the relative cathode size. What is the "unfavorable" area ratio (which would be worse -a small anode/large cathode or a small cathode/large anode?)? Explain.

Describe an engineering situation different from those previously discussed in which you encounter a corrosion reaction (either intentionally or unintentionally). If this is an intentional process what is its purpose? If this is an unintentional process how do you deal with it?

Attach your completed data sheets.