Lab Notebook

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| Conductivity Grading Rubric |
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1. Format – Reference to procedure, data is neat and legible.
2. Data/log/observations – Data clear and legible, all data in ink originally.
3. Signature and stamp – student signature and instructor stamp on each page of data.

Formal Report

1. Title page – Include name, expt title, instructor name, date, and copy the grading rubric from the right onto the page. (I will fill in the scores, you don’t need to do that!)
2. Objective – Why are you doing this experiment? What do you hope to learn?
3. Introduction – Integrate the information below into a cohesive introduction
   1. Name the three principal bond types.
   2. Define the following terms and tell what kind of bonding is expected in solutes that are
      1. Nonelectrolytes
      2. Strong electrolytes
         1. What is the meaning of the term “hydration” when used to describe what happens to an electrolyte which is dissolved in water?
      3. Weak electrolytes
         1. What is meant by dissociation and what is an example of a substances that dissociates?
         2. What can be inferred about the degree of ionization or dissociation of a substance that is a weak electrolyte?
   3. What is the essential characteristic of a solution that is (Include information regarding its behavior as well as the types of substances which indicate these types solutions.)
      1. A nonconductor
      2. A good conductor
      3. A poor conductor
4. Procedure (reference correctly) – Summarize any changes to the experiment or clarify any vague points in the published procedure.
5. Discussion - Discuss any errors that may have occurred during the experiment (Contamination? Volume sample? Area Electrode surface touching sample? Concentrations?) and how they may affect your data.
6. Conclusions – Did you achieve your objective? Explain briefly. This should be 2 or 3 sentences
7. Post lab questions –Answer the questions in blackboard. There are 3 parts to the questions, the 1st 2 are graded by computer and the 3rd is graded manually. The questions for the 3rd part are listed below. Be sure that you have answered them to your satisfaction as you will have only one attempt for part 3.

Part 1

* Write the equation for the reaction that forms the few (but important) ions in pure water.
* Why is tap water more conductive than distilled water?
* Write an equation to describe the formation of ions in aqueous acetic acid.
  + Why does acetic acid form ions when it is dissolved in water but not when it is in the pure (glacial) form?
* The models of solid NaCl describe it as consisting of Na+ cations and Cl- anions.
  + If this is the case, why is NaCl(s) not an electrolyte?
  + Explain the distinctly different behavior in the conductivity of NaCl(s) and NaCl(aq).
* Explain the different behavior in the conductivity of KClO3(s) and KClO3(l).

Part 2

* Why is the conductivity of HCl different in the two solvents? What causes this difference?

Part 3

* Write the equations for the reactions of CaCO3 and zinc with acetic acid and hydrochloric acid.
* Discuss any correlation between the rates of the chemical reactions of 6M acetic acid and 6 M hydrochloric acid and the conductivities observed for acetic acid and hydrochloric acid in part 1?

Part 4

* Describe what happened as you reacted 0.1 M HCl with 0.1 M NaOH.
  + Write the conventional equation, total ionic equation, and net ionic equations the reaction of 0.1 M HCl with 0.1 M NaOH.
* Explain any changes in conductivity you detected for this reaction.
* Describe what happened as you reacted 0.1 M CH3COOH with 0.1 M NH3
* Write the conventional equation, total ionic equation, and net ionic equations the reaction of 0.1 M CH3COOH with 0.1 M NH3
* Explain any changes in conductivity you detected for this reaction.
* Describe what happened as you reacted 0.1 M H2SO4 with 0.1 M Ba(OH)2
* Write the conventional equation, total ionic equation, and net ionic equations the reaction of 0.1 M H2SO4 with 0.1 M Ba(OH)2
* Explain any changes in conductivity you detected for this reaction.