

Name

Date

Period

Grade:

EXPERIMENT 40

CONDUCTIVITY, IONIZATION AND DISSOCIATION

PRELAB QUESTIONS:

1. Define the following terms: electrolyte, nonelectrolyte, strong electrolyte, weak electrolyte, dissociation, ionization.
2. Write equations for the complete ionization (that will require more than the one equation in some instances) of each of the following in water: $\text{HC}_2\text{H}_3\text{O}_2$ (CH_3COOH , acetic acid), H_2SO_4 (sulfuric acid), HCl (hydrochloric acid), NH_3 (ammonia).
3. Write an equation for the dissociation of each of the following bases in water solutions: $\text{Ba}(\text{OH})_2$ (barium hydroxide), and NaOH (sodium hydroxide).
4. Write an equation for the dissociation of each of the following salts in water solutions: CuSO_4 (copper (II) sulfate), KClO_3 (potassium chlorate).

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DATA TABLE:

| SUBSTANCE | OBSERVATION ELECTROLYTE(STRONGWEAK) OR NONELECTROLYTE |
|--------------------------------|--|
| $C_{12}H_{22}O_{11}(s)$ | |
| $KClO_3(s)$ | |
| $KClO_3(l)$ | |
| tap water | |
| distilled water | |
| $C_2H_5OH(l)$ | |
| 0.1 M $C_{12}H_{22}O_{11}(aq)$ | |
| 0.1 M $NaOH(aq)$ | |
| 0.1 M $KClO_3(aq)$ | |
| 0.1 M $NH_3(aq)$ | |
| 0.1 M $H_2SO_4(aq)$ | |
| 6 M $HCl(aq)$ | |
| 0.1 M $HCl(aq)$ | |
| 6 M $CH_3COOH(aq)$ | |
| 0.1 M $CH_3COOH(aq)$ | |

| SUBSTANCE | OBSERVATION | REASON FOR CONCLUSION |
|---|-------------|--------------------------|
| Determining the effects of a precipitate | | |
| Compare 1 drop to 5 drops of a 0.1M solution of $CuSO_4$ | | |
| Compare the conductivity of 6M glacial acetic acid, and 0.1 M acetic acid | | |

CONCLUSIONS AND QUESTIONS:

1. Name a weak electrolyte, a strong electrolyte, and a nonelectrolyte tested in this experiment.
2. Ions are found in water as a result of two different processes, ionization and dissociation. Describe the difference between ionization and dissociation.
3. How do water molecules participate in the process of ionization of a molecular compound such as HCl in water solution?
5. How do water molecules participate in the process of dissociation for an ionic compound such as NaCl in water solution?
6. Based on your experimental evidence, how do organic solids and liquids rate as electrical conductors?
7. Write an equation for the reaction of $\text{Ba}(\text{OH})_2$ and H_2SO_4 .

Discussion**Conclusion**