**Preparing Buffer and Buffer Capacity**

# Teacher Notes

**Lab Time**: 80 minutes

**Preparation:**

**Time:** 30 minutes

**T:** Make available a set of materials for each lab group.

**T:** Prepare 0.10 M acetic acid by dissolving 5.75 g of glacial acetic acid in enough water to make 1 liter of solution.

Prepare 0.30 M acetic acid by dissolving 17.2 g of glacial acetic acid in

enough water to make 1 liter of solution.

Prepare 0.50 M acetic acid by dissolving 28.7 g of glacial acetic acid in enough water to make1 liter of solution.

Prepare 0.100 M NaOH by dissolving 4.00 grams of the solid in enough water to make 1 liter of solution.

**V:** The van can provide equipment and materials as needed.

**Answer to Questions**:

1. How does the concentration of the buffer affect the buffer capacity?

*The higher the concentration of the buffer, the greater the buffering capacity.*

1. What differences would be observed if HCl were used in place of NaOH?

The solution would still be buffered and resist a change in pH to the same extent. When the pH did change it would decrease rather than increase.

1. Write equations to show how a buffer works.

HC2H3O2 ↔ H+ + C2H3O2-

Add base H+ + OH- ↔ H2O Equation 1 shifts right by Le Chatelier’s principle

Add acid: Equation 1 shifts left by Le Chatelier’s principle.

**Considerations:**

Other buffer concentrations could be used. Basic buffers made from NH3 and NH4Cl could also be used.

This buffer could also be titrated using HCl.

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